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ABSTRACT

In November 1989, nine research designs developed to assist local colleges in the evaluation of their matriculation activities were disseminated to the California community colleges. These designs, created as part of the Local Research Options Project, focused on measuring the effects of the colleges' matriculation activities on student performance, goal changes, and satisfaction, and on access and fairness. Reports and/or data resulting from the research designs were solicited from the colleges in summer 1991. This collection contains the following summaries of materials compiled for each design: (1) "Comparing the Academic Performance of Students Who Are Fully, Partially, or Not Served by Matriculation Services: A Retrospective Approach," by Richard Rasor; (2) "An Evaluation of Student Academic Success Before and After Implementing Matriculation," by Richard Rasor; (3) "An Experimental Comparison of Alternative Matriculation Treatments," by William Threlfall; (4) "Disproportionate Impact and Reading, Writing, and Math Assessments," by Jon Kangas; (5) "Evaluating the Effectiveness of Remedial Placement," by Marty Dunlap; (6) "History Course Success Based on English Eligibility," by Scot Spicer; (7) "Student Access and the Implementation of Matriculation," by Richard Rasor; (8) "Monitoring Changes in Student Goals Before and After Matriculation," by Jon Kangas; and (9) "Student Satisfaction With Matriculation," by Scot Spicer. Appendixes include a seven-page summary of a telephone survey on matriculation research and the survey instrument. (JSP)

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Matriculation Evaluation: Monographs on Designs from the Local Research Options Project

February 1992
Sponsored by the Chancellor's Office
and Developed by
The Matriculation Local Research Options Committee:

Marty Dunlap (Chair)
Butte College
CCLC Research and Planning Committee

Jon Kangas
San José / Evergreen Community College District
Matriculation Regional Advisory Committee

Richard Rasor
American River College
NORCAL Community College Research Group

Scot Spicer
Glendale Community College
SCCCIRA
CCLC Research and Planning Committee

William Threlfall
Chabot College
NORCAL Community College Research Group

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S. Spicer

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Introduction

In November of 1989, nine research designs, aimed at assisting colleges in evaluation of their matriculation activities locally, were disseminated to the California Community Colleges. These designs were developed as part of the Local Research Options Project, sponsored by the Chancellor's Office, and focused on measuring the effects of matriculation on student performance, access and fairness issues, as well as student goal changes and satisfaction. Regional workshops were offered on the use of the designs and telephone consultation to the field was provided as necessary. Colleges were surveyed in October of 1990 regarding their use of the nine designs and their progress with the research studies. Colleges that had responded affirmatively received letters during the summer of 1991 soliciting their reports and/or data. The following monographs summarize the findings generated thus far from the use of the nine designs.

The purpose of the monographs is to aggregate the colleges' findings wherever feasible, to allow for a broad review of matriculation evaluation efforts and to provide pertinent feedback regarding the use of common research designs in future evaluation activities. Each monograph will delineate the purpose of the research design, the recommended methodology, the results for colleges submitting data and discuss the meaningfulness of the outcomes. When the methodology of the design was altered, it is noted within the monograph. In addition, difficulties that arose with the methodology will be addressed and possible modifications are proposed for future use of the design.

There is a caveat regarding matriculation evaluation which is critical to keep in mind when reviewing the monographs. In July 1990, the Chancellor's Office published and distributed a document to the field, Standards, Policies and Procedures for the Evaluation of Assessment Instruments used in the California Community Colleges. Upon receipt of that document, colleges began to shift the focus of their research efforts from evaluating the overall impact of matriculation activities to validating their assessment instruments and practices. Limited resources were redirected to what appears to be a more vital need. Another set of designs related to the validity and fairness of assessment practices were developed and distributed to assist colleges with this effort. However, due to this shift in focus, there is much more activity occurring in assessment validation research than in evaluating the effectiveness of matriculation.

Fewer reports were received for use in these monographs than anticipated. Although colleges probably are engaged primarily in research related to assessment validation, they may have been hesitant to submit their studies. A number of schools did not use the designs developed to assist them as they either already had research activities underway or had other evaluation models they were interested in utilizing. The Local Research Options Project committee members believed that there was much more research being conducted throughout the state on the effectiveness of matriculation than the limited number of received reports reflected. The committee volunteered to survey the California community colleges on their matriculation evaluation research efforts undertaken since Fall 1989. The results of the survey are encouraging regarding the evaluation activities occurring in the colleges and are presented in an appendix of this document.

Colleges have experienced a range of barriers that have frustrated their efforts in conducting research. These difficulties have been identified by colleges in their progress reports to the Chancellor's Office. These have to do primarily with lack of staff skilled in conducting research, time delays in modifying existing information-gathering procedures and computer support in compiling the necessary data. Although colleges have been hampered in their desire to provide meaningful data that reflects on the effectiveness of their matriculation activities, the following monographs should elucidate initial findings that all colleges engaged in research activities can benefit from reviewing.

Monograph on Design 1

Comparing the Academic Performance of Students Who Are Fully, Partially, or Not Served By Matriculation Services: A Retrospective Approach

Prepared by Richard Rasor

Abstract

The purpose of this study was to determine whether receiving varying matriculation services is related to student academic performance. The following research question was addressed: What differences exist in academic performance among students who were fully-served, partially-served, or not-served by matriculation? The design was an ex post facto model comparing students who self-selected their treatment or who were allowed to bypass some service because all services may not have been in place.

Six colleges provided data from which the following conclusions are drawn for fully-served matriculants: 1) they did not have the highest first semester GPA due in part to larger unit loads than those students who were partially or not served; 2) they often demonstrated higher first semester success rates, especially if matriculation treatments were robust, and unit load was equated across groups; 3) they sometimes demonstrated higher first semester retention (within term) especially at higher load levels (e.g., 8.5+ units); and 4) they tended to persist longer. The report stresses the need for comparable characteristics across groups (e.g., unit loads), and a more rigorous set of matriculation treatments.

Introduction

Research utilizing this model attempted to answer the following question: What differences exist in academic performance among students who were fully-served, partially-served, or not-served by matriculation activities? The purpose of this design was to determine whether receiving varying matriculation services is related to measures of student academic performance.

The ideal research approach would have been to randomly assign student matriculants to each of the three conditions (or to fully-served versus not-served). As in any randomized experimental design, student background variables (possible confounding variables) would have been randomized across groups thereby cancelling out or at least minimizing their effect. In this manner the treatment (matriculation services) would be effectively isolated as the essential difference between groups of students. However, under matriculation regulations all non-exempt students must receive services. In other words, a true control group can not be utilized. Thus, the design has to be to an *ex post facto* model comparing students who self-selected their treatment or who were allowed to bypass some service because all services may not have been in place.

This situation creates difficulties for interpretation of research data because without random assignment, one cannot fully isolate the treatment variable and results are then merely correlated. Suppose a not-served group earned higher grades than any other group. This type of finding, contrary to what was expected, could be explained in a variety of ways such as: the students may have enrolled in fewer units, or they may have been older and more dedicated, or had specific educational needs and were more motivated. These methodological constraints apply to any non-experimental design and are important to bear in mind when evaluating the results.

Method

Design

The research approach was retrospective, that is, data already existed. Earlier records were examined to determine which matriculation services students had received. These students were categorized into one of three groups:

Fully-served. Non-exempt students who (1) were admitted, (2) received orientation, (3) were assessed before registration, (4) received at least one counseling session before registration, and (5) registered.

Partially-served. Students who (1) were admitted and received at least one matriculation service (2 through 4), but not all such services and (5) registered.

Not-served. Students who (1) were admitted and received no matriculation services (2 through 4) but did (5) register.

The criterion or outcome variables for these groups consisted of the following:

1. **GPA** - first semester
2. **Success rate** - first semester (units associated with grades of *A, B, C,* or *Credit* divided by units enrolled)
3. **Retention rate** - first semester (units associated with grades of *A, B, C, Credit, D,* or *I* divided by units enrolled)
4. **Persistence** (number of students who reenrolled the following semester)

Colleges Reporting

Two letters (initial and follow-up) were sent to every California community college asking if they had conducted research using Design #1. Three colleges reported that they were planning to conduct the study but had not yet done so. One college reported in a letter that they, as well as their sister colleges, had attempted the study but became painfully aware of an unreliable information system. It is worth noting, however, that this college did report fully-served students as having the highest persistence rate. Six colleges did submit reports and their results will be the focus of this monograph.

Results

College A

College A collected data for Fall 1988 and Fall 1989 semesters. Fully-served (FS) students (N=513) who intended to enroll in 7 or more units were required to enroll in a 1.5 unit orientation course lasting eight weeks. (Note: The course constituted a robust treatment when contrasted with a one hour orientation, a 1-2 hour assessment session, and a 20-30 minute counseling appointment which is typical of many colleges.) Partially-served (PS) students (N=706) received the basic matriculation services but were exempt from the course. Finally, there were 542 Not-served (NS) students.

Results indicated greater persistence for Fully-served students whether full-time or part-time status (FS average = 83%, PS average = 57%, NS average 38%). Fully-served students also completed more units successfully whether full-time or part-time (FS average = 77%, PS average = 58%, NS = 48%). Within-term retention favored the FS group (95% versus 83% for Not-served). GPA results favored those students receiving either full or partial services.

Limitations: College A did not give a complete description (e.g., unit loads) of all three groups and used a different definition of success rate (see Table 1). No tests of statistical significance were reported.

College B

This college studied all freshmen students (N=4810) who enrolled during the Fall 1990 semester. Students taking 12+ units were "asked" to proceed through assessment, orientation, and counseling. Those with less than 12 units were not asked to participate in matriculation activities. The final student counts were FS=460, PS=796, NS=3554. Results reveal the importance of examining student unit loads.

There appears to be an interaction between unit load and services received upon various criterion measures. Statistically significant differences for success rate favored the FS group (62%) over the PS group (54%) at the 8.5 to 12 unit load level. Significant retention rates favored the FS group (74%) over the PS group (64%) at the 8.5 to 12 unit level and at the 12.5 to 28 unit level. Other outcomes were nearly the same values or even opposite to what was expected depending upon students' load level.

Limitations: College B used a modified definition of success which is covered in Table 1.

College C

This college took a random sample of entering freshmen students (N=318) in Fall 1986 who were tracked through Fall 1988 by examination of individual transcripts. All had no prior college experience. During this period of time, students were told of matriculation services but the educational guidance climate was permissive as to whether a student took advantage of matriculation. The counts were FS=92, PS=194, and NS=32. The average units enrolled in for all three groups remained very close except that the NS group averaged 1 unit less the first semester and 5 units less after five semesters. The units enrolled in for the FS and PS groups were nearly identical. Results indicated that success rates were highest for the FS group (79.4%) and least for the NS group (73.1%). Persistence, five semesters later, also favored the FS group (average of 3.5 semesters of attendance), PS (average of 3.3 semesters of attendance), and NS (average of 2.7 semesters of attendance).

Limitations: Different method of measuring persistence (see Table 1), relatively small sample size although minimum necessary to be representative of population.

College D

College D took a sample of 183 students (FS=50, PS=83, NS=50). The report indicated that in order to obtain a sample of Not-served students, off-campus classes were selected. Because the treatment is confounded by off-campus selection (generally students took one class only), only the FS and PS groups will be discussed here and included in the upcoming composite table. Results were contrary to what would be expected in that the PS group had slightly higher values for GPA, success rate, retention, and persistence than the FS group.

Limitations: Small, non-random sample; possible serious bias in comparing main campus to off-campus students; no statistical significance tests were reported.

College E

This college was only able to compare Partially-served (N=1,232) with Not-served students (N=686) from Fall 1988 through Spring 1990. Fully-served students, at the time, amounted to less than 1% so were not treated as a separate group. Using judgmental cut values, results were dichotomized into success or not (60%+ versus below 60%), retained or not (60%+ versus below 60%), and GPA (2.0 and greater versus lower than 2.0). All statistical analyses were run on 4

cells. Results indicated that first semester success rates were statistically higher for Partially-served students, but there was a reversal in subsequent semesters. There was no significant difference in GPA or retention. Yet, Partially-served students consistently had higher persistence rates than the Not-served group. More detailed analysis revealed that students taking 6+ unit loads were more likely to be successful and be retained than students taking fewer units.

Limitations: Different definition of the outcome measures resulting from dichotomization.

College F

This college reported data which were impressive, based upon large numbers of students, but no detailed report was forwarded. What was received was a single table of outcomes, and an indication if results were significant.

College F compared performance of Not-served (N=793) with assessed only (N=656), oriented only (N=231) and orientation plus assessment (N=722). The counseling component was not yet available. Comparing Not-served with Partially-served (orientation plus assessment) revealed the following: No significant differences in first semester or cumulative GPA; significant success rates for PS (61.2%) versus 46.3% for NS; significant retention rates for PS (64.1%) versus 49.8% for NS; and significant persistence for PS (84.2%) versus 55.5% for NS. The author also stated in a footnote to the table that when unit loads are examined, group differences are similar to those listed in the table for all but the lightest load (1-5 units).

Limitations: Not enough information given about procedure, definitions, and details of the treatments.

The following table presents the composite results for colleges A through F. A discussion follows the table.

Table 1

Composite Criterion Values for Varying Matriculation Treatments

Criterion Measure	College	Fully-Served	Partially-Served	Not-Served
GPA (first semester)	A	2.50	2.91	2.25
	B	2.25**	2.12**	2.27**
	C	2.40	2.50	2.50
	D	2.74	2.79	
	E		2.25	2.39
	F		2.19	2.10
Success (first semester)	A	77%*	58%*	48%*
	B	62%**	56%**	57%**
	C	79%	78%	73%
	D	77%	84%	
	E		56%	62%
	F		61%	46%
Retention (first sem.)	A	95%*		83%*
	B	74%**	66%**	64%**
	C	70%***	75%***	72%***
	D	82%	87%	
	E		66%	71%
	F		64%	50%
Persistence to Next Term	A	83%	57%	38%
	C	3.5****	3.3****	2.7****
	D	41%	61%	
	E		61%	46%
	F		84%	56%

* Success rate for College A is defined as the percentage of students who were successful (*A, B, C, CR*) in more than half the classes in which they enrolled.

* Retention (first semester) for College A is the percentage of students who earned at least a *D* in at least one course.

** Success rate for College B also includes incomplete grade notations provided the student was performing *A, B,* or *C* level work. Data are for students enrolled in 8.5+ units.

*** Retention (first semester) for College C includes the *F* grade notation.

**** Persistence for College C is the average number of semesters enrolled from a possible time period of 5 semesters.

Discussion

***GPA*:** Fully-served matriculants generally did not have higher first semester GPAs than Partially-served or Not-served students.

The explanation given most often is that the Not-served or Partially-served groups took fewer units thereby making it easier to obtain higher grades. Furthermore, the *W* grade notation is not a part of

GPA computation. College B examined the interaction of unit load with services received upon GPA. They found a higher GPA for the Fully-served group at the 4.5 to 8 unit level. Other colleges indicated that self-selection into treatment may have played a role in GPA. The scenario was that students who are more anxious about academic performance (because of past performance) may elect to be Fully-served than those who are more confident and may elect to not receive all services.

Success Rate: Fully-served matriculants often demonstrated higher first semester success rates than Partially-served or Not-served students.

Success rates are based upon grades earned which may interact with unit load as previously mentioned. Most of the colleges provided a minimum set of matriculation services (assessment, orientation, counseling). One may pose the question: Why would 2-3 hours of matriculation activities affect a student's academic performance? The treatment simply may not be rigorous enough to detect a difference. Some evidence to support this contention comes from College A who required a 1.5 unit course for all students taking 7+ units. The purpose of the course was to develop a comprehensive educational plan and teach survival skills. The success rates were notably higher for students taking the course.

Retention (within-term): Fully-served matriculants sometimes had higher first semester retention rates than Partially-served or Not-served students.

College A, with a required course, and College B, which examined unit load, reported higher retention rates for Fully-served students. It is worth noting that retention rates were between 9% and 10% higher for Fully-served students at 8.5-12 units and 12.5 to 28 units, over the Not-served students.

Persistence (first term to next term): The degree of matriculation services received seems related in a positive sense to persistence.

While results are sparse, most of the reporting colleges indicated that matriculation affects persistence; the more services received, the higher the persistence.

While these six colleges represent a small sample, there are four important points to be made:

1. The traditional treatment package (orientation, assessment, counseling) may not be sufficiently rigorous. Because of sheer new student volume, some counseling sessions may be as little as 15 minutes. Research studies need to establish whether more intense matriculation treatments yield higher student academic outcomes. The trickle of present evidence would suggest so.

2. When comparing groups of matriculants, it is important to control for unit load. Fully-served students taking more units cannot be adequately compared with partially or not-served students taking fewer units because the matriculation treatment variable is confounded with the load variable. Of course, it may be difficult to locate a suitable not-served group. If one has computer capability and support, matching students' backgrounds and unit loads would help assure roughly equivalent groups who received different degrees of matriculation services and minimize the impact of confounding variables.

3. It is difficult to compute college results when different operational definitions are used for either treatment or criterion measures. Uniformity is highly desirable.

4. Higher persistence is the finding most often related to matriculation treatment as reported by the colleges.

Monograph on Design 2

An Evaluation of Student Academic Success Before and After Implementing Matriculation

Prepared by Richard Rasor

Abstract

The purpose of this study was to determine if matriculation had any impact upon the academic achievement of students. The research question was: Did matriculated students earn more A, B, C, or CR grades than students earned prior to implementing matriculation services? The procedure compared grade performances of similar students during pre- and post-matriculation implementation periods.

Seven colleges submitted their findings. Success rates were down a little (about 1%) after fully implementing matriculation. This may be due to the strengthening of standards and a continuously changing student demography. The within-term retention changes were mixed with three colleges reporting small positive changes following the implementation of matriculation and the other three colleges reporting very slight changes. The average retention gain (pre + phase-in to post) was an increase of 0.6% which is based upon thousands of grades. The results may also reflect contextual factors other than matriculation.

Introduction

The purpose of this study was to determine if matriculation had any impact upon the academic achievement of students. More specifically, the research question was: Did matriculated students earn more *A, B, C, or CR* grades than similar students earned prior to implementing matriculation services?

A procedure for answering the question compares student performances pre- and post-matriculation implementation (a before-after design).

While this design is relatively simple and straightforward (if data are easily accessed), it has one very serious limitation. If there is a positive change in student outcomes (e.g., post-implementation outcomes are higher than pre-matriculation), one cannot claim that only matriculation services caused the change. Students from the pre-matriculation years may have been different demographically, in addition to differences in other contextual factors, not just matriculation (e.g., the economy). The point is that the matriculation treatment, given to some and not to others, can not be isolated as a causal agent. Therefore, interpretation of results must be considered as correlational.

Method

Design

Each reporting college was to have prepared summary counts of student grade notations from academic years pre- and post-matriculation periods. The phase-in period was also an option. Colleges were encouraged to compare only similar student groups. For example, if only students carrying 7+ units were matriculated in a post-period, then the same cohort should have been examined during the pre-matriculation period.

Procedure

The summary counts were to be converted into percentages of successful grade notations (i.e., *A, B, C,* or *CR* grades). Some colleges also included grade notations of *D* and *I* to enable forming a within-term retention percentage.

Grade percentages from academic terms were combined to form academic years covering the pre-, phase-in, and post-matriculation years.

Results

Seven colleges approximated this design and forwarded reports. Some institutions reported success rates while others reported only retention results. A synopsis of the results from each college follows. After that will be a discussion section.

College A

They reported over 12 semesters of grade data covering not the traditional pre, phase-in, and post-matriculation periods (e.g., orientation, assessment, counseling), but years of open course enrollment; phase-in of a skills prerequisite system; then mandatory assessment and mandatory placement; and finally, the period of time covering mandatory assessment with recommended placement.

When data were collapsed into the four time periods and into categories of success and retention, there was a slight drop (less than 1%) in average success rate and in within-term retention from earlier periods to the present.

Limitations: College A did not report how the skills prerequisite system interfaced with implementation of the basic matriculation services.

College B

This college reported population within-term average retention rates over various years but not success rates. When data were aggregated into pre-, phase-in, and post-matriculation periods, there was slightly more retention (<1% gain) in the post period. This was also true at a sister college discussed next.

Limitations: The *I* grade notation was not included in the definition of retention and the *IP* designation was counted against it.

College C

Covering 1985 through Spring 1990, this college reported population within-term average retention increases of 3.4% beyond the rates during the pre- and phase-in periods of matriculation.

Limitations: As with College B, this college did not include data on success rate; the *I* notation is omitted from the definition of retention; and *IP* notations are charged against it.

College D

This college prepared a short report on the population within-term average retention rates from Spring 1984 to Fall 1990. Retention increased by 0.8% in the post-matriculation period.

Limitations: It was unclear when the pre-period ended and the phase-in began. Also, percentages had to be extrapolated from a graph.

College E
A sister institution to College D, they reported virtually no change in within-term retention rates, pre- and phase-in = 70%, post-matriculation average 69.9%.

Limitations: Same as College D above.

College F
This college had no mechanized way of isolating data on matriculants only. Instead, they took 13 general education courses with high density enrollments of freshmen and compared total success and retention rates (over 20,000 grade notations) across two time periods, pre-matriculation (3 semesters) and post-matriculation (3 semesters). Results indicated little or no change across the time periods, success=55.6% and 55.2%, respectively, and retention=63.0% and 62.5%, respectively.

Limitations: College F did not examine total grade data on purely "matriculants".

College G
Two random samples were selected (N=232 and 231). One received a portion of matriculation services (phase-in) and another later group of students were fully-served matriculants. College G reported a slight decline in success rate from 58.9% to 56.5%. They indicated this could be a function of strengthening academic standards (Title 5) and/or increased student ethnic diversity.

Limitations: No clearly interpretable within-term retention data reported.

The following table presents the composite results from the seven colleges.

Table 1
Average Success and Retention Rates During Pre-, Phase-in, and Post Matriculation Periods

Success Rates (%)

College	Pre-Matriculation	Phase-In Matriculation	Post-Matriculation
A*	63.0	62.7	62.1 & 62.2
G		58.9	56.5
F	55.6		55.2

Within-Term Retention (%)

College	Pre-Matriculation	Phase-In Matriculation	Post-Matriculation
A*	68.5	68.4	67.8 & 67.6
B**	71.0	70.7	71.6
C**	70.9	70.9	74.3
D		71.8	72.6
E		70.0	69.9
F	63.0		62.5

* College A reported data on pre-, phase-in, and post periods of mandatory assessment + mandatory placement (62.1), and mandatory assessment with only recommended placement (62.2).

** Colleges B and C had slightly different operational definitions of retention (*I* and *IP* grades counted against retention).

Discussion

The collective data would suggest that success rates are down a little (about 1%) after fully implementing matriculation. If a goal of matriculation is a better fit between curriculum and student skill levels, then success rates should increase with better placement procedures. But this logic is offset by the strengthening of standards and a changing student demography.

The rates of within-term retention changes are mixed with three colleges reporting small positive changes following implementation of matriculation and the other three reporting very slight decreases. The average gain (pre + phase-in to post) was an increase of 0.6%. However slight this gain is, it is based upon thousands of grades. Of course, such rates may have much to do with contextual factors other than implementation of matriculation activities.

Returning to the question, did matriculated students earn more *A, B, C* or *CR* grades than students earned prior to implementing matriculation services? The answer, based upon these colleges' results, is "no", but the within-term retention rates may have increased a little.

Monograph on Design 3

An Experimental Comparison of Alternative Matriculation Treatments

Prepared by William Threlfall

Introduction

This design was aimed at the following question: Is one matriculation method more effective than another? The purpose of the study was to use the traditional experimental methods of the behavioral sciences to evaluate and compare the effectiveness of alternative matriculation treatments. The design can compare two completely different matriculation programs; alternatively, it can compare different versions of one or more specific components (e.g., new orientation vs. old orientation, group vs. individual counseling).

Method

Design

The research plan specified a between-groups experimental design with students assigned randomly to one of two matriculation methods. Outcome measures included first term success rates and course retention rates together with second-term success rates and persistence rates for each student.

Subjects

The design called for at least 200 student research participants drawn from the general population of non-exempt students.

Procedure

Students participating in the research were to be identified in advance of the delivery of matriculation services.

Each student in the study sample should be assigned randomly to receive one of the matriculation methods. Each participant should receive a note of explanation that might be worded as follows:

> We are evaluating our procedures for new students. As part of this evaluation, different students may complete somewhat different procedures. For you [orientation (or) counseling] will involve [describe as appropriate].

Demographic and outcome data for each student should be collected at a time and manner most convenient for the participating college.

Results

Outcome Measures

For each student, the design called for the following outcome measures:

First-term success rate
First-term course retention rate
Second-term success rate
Second-term persistence rate

Analysis of the Data

The design called for the first-term mean success rate and mean retention rate to be computed for each group. In addition, the mean second-term success rate was to be computed. Finally, the frequency and percentages of students in each group who persist to the second term were to be computed.

Individual Colleges' Data

Out of thirteen colleges who indicated in October of 1990 that they intended to conduct a study following Design 3, only one had data available by September, 1991. Others had cancelled plans for a Design 3 study, or had deferred execution of the study to a later date. The one completed study departed radically from the specified design; it did not employ the random assignment of students to treatments that is essential to the method of Design 3. Findings from that study are not presented in this document.

Discussion

It appears that most colleges have focused research activities on evaluation of their existing matriculation program; few have begun research to optimize matriculation by comparing alternative approaches, although such efforts may become more common as matriculation programs evolve. Also, it appears that colleges have started their matriculation research with descriptive methods that use existing data rather than formal experimental methods that require planning in advance of service delivery and data collection. This trend too, may change over time.

Monograph on Design 4

Disproportionate Impact and Reading, Writing and Math Assessments

Prepared by Jon Kangas

Abstract

The purpose of this design was to organize data to monitor for a disproportionate impact on special populations groups as they proceed from placement testing through enrollment in nondegree basic skills courses to college-level courses. The special populations of particular interest to California community colleges include age, gender, ethnicity and disability groups.

Eleven community colleges submitted their studies related to disproportionate impact and reading, writing, and math assessments for use in this monograph. The colleges are from northern and southern California and represent urban, suburban, and rural communities. A wide variety of reading, writing, and math placement tests were represented. The results were calculated using the formula outlined in the original Design 4 and also using the Equal Employment Opportunity Commission (EEOC) guidelines related to hiring practices. Ethnic categories for the eleven colleges were collapsed to allow for comparisons between colleges. Because age, disability, and gender data were not available for the enrolled and persisting groups, conclusions are drawn only from the ethnicity data.

I Tested to Nondegree Placed

Sixty-one percent of the calculations using the EEOC guidelines indicated a possible disproportionate impact by ethnicity across nine colleges for the testing instruments of reading, writing, and math skills. Seventy-two percent indicated a possible impact with the 20% guideline of Design 4. To the extent that a particular non-white group enters college with lower reading, writing, or math skills out of high school, one would expect a placement test to place the students into lower level courses than the comparison group. If this disparity of skills is anticipated, then it would appear reasonable that placement tests across several colleges and disciplines are revealing valid differences.

II Nondegree Placed to Nondegree Enrolled

Although the number of comparisons from four colleges is small, the data is encouraging. Very little impact for one group over another was found related to testing and subsequent enrollment in nondegree basic skills courses. Only 3 of 14 (21%) comparisons raised the possibility of a disproportionate impact. Should an impact be detected in this area, any of the activities or events that take place between testing and enrollment in classes may be related to differences in enrollment patterns and could be examined.

III Nondegree Enrolled to Nondegree Persisters

None of the comparisons of three colleges' data revealed an impact as students moved from nondegree courses into college-level coursework. Many more studies are needed before clear conclusions can be drawn. However, the current data is encouraging.

It appears that a variety of placement tests are picking up valid differences in the skill levels of underprepared students. Although a disproportionate impact is expected by ethnicity in the Tested to Nondegree Placed comparisons, individual colleges still need to provide information to substantiate why a particular group is disproportionately impacted. If differences are detected, it is recommended that colleges: 1) recheck their data, 2) replicate the study, 3) demonstrate that there are differences in the entering skills of groups substantiated by other sources of information, 4) monitor the affected group(s) as they enroll and complete nondegree basic skills courses, and persist into college-level courses, and 5) reconfirm the validity of their placement tests.

From the limited data available for this report, there appears to be very little disproportionate impact by ethnicity between Placement to Nondegree Enrolled, and between the Nondegree Enrolled to Nondegree Persisters to college-level work.

Of particular note is that 11 of 13 (85%) of the Nondegree Enrolled groups had over 65% of their students persisting to college-level courses after one semester. Five of thirteen groups were at or above 80%. This is very positive and encouraging evidence for the matriculation process and the programmatic efforts of colleges to serve underprepared students.

There were several instances in which an ethnic group did not persist to college-level courses at a 65% or higher rate. If nondegree students, heavily comprised of underprepared ethnic minority students do not persist to college-level work, they may never achieve higher levels of education, necessary for social equity. To the extent that any group, regardless of ethnicity, does not progress to college-level courses, additional research needs to be conducted to help determine why.

It is clear that ongoing research and the monitoring of disproportionate impact of assessment and success of nondegree students is needed and should be a high priority on the research agenda of colleges. But even more so, is the monitoring of nondegree basic skills students who persist to college-level work. Breaking down the data by ethnicity, age, gender and disability can help an institution focus its efforts on curriculum modification and programs that are responsive to the needs of underprepared students.

Introduction

This study's purpose was to organize data related to testing, placement in nondegree basic skills courses, nondegree enrollment in basic skills courses and the persistence of nondegree basic skills students to college-level coursework. This organization of data was to allow for monitoring for a disproportionate impact on special population groups as they proceed from placement testing to college level-courses. The special populations of particular interest to California community colleges include age, gender, ethnicity and disability groups.

The matriculation regulations define disproportionate impact as follows:

> "disproportionate impact occurs when the percentage of persons from a particular racial, ethnic, gender, age, or disability group who are directed to a particular service or placement based on an assessment instrument, method or procedure is significantly different than the representation of that group in the population of persons being assessed and that discrepancy is not justified by empirical evidence demonstrating that the assessment instrument, method or procedure is a valid and reliable predictor of performance in the relevant educational setting." [Section 55502 (e).]

The original Design 4 was aimed at answering the following research questions:

1) Does a disproportionate impact occur between testing and eligibility for placement into nondegree-applicable and degree-applicable basic skills courses related to the placement test (e.g., math placement related to a math test)?

2) Does a disproportionate impact occur between nondegree and degree basic skills course placement and enrollment into nondegree and degree-applicable basic skills courses?

3) Does a disproportionate impact occur between enrollment in nondegree basic skills courses and subsequent enrollment in college-level courses?

The three research questions posed above have been refined from the original design to more precisely reflect the three comparisons made. The names of the comparison groups also have been slightly modified.

None of the 11 colleges responding had age, disability or gender data for the Nondegree Enrolled or College-level Persisters groups. Several had the data for the Tested to Nondegree Placed group comparison. Therefore, examples of age, disability and gender are presented with data from the Tested to Nondegree Placed groups. Because age, disability, and gender data were not available for the enrolled and persisting groups, general conclusions were drawn only from the ethnic data.

Method

Subjects

1. *Tested*: The 11 colleges used from one to two semesters of data for reading, writing and/or math assessments to constitute their tested group. The data was only used for students new to the colleges.

2. *Nondegree Placed/Degree Placed*: Of the students in the tested population, these groups represent those who were eligible to have been placed by their reading, writing or math scores into the colleges' nondegree or degree-applicable basic skills courses.

3. *Nondegree Enrolled/Degree Enrolled:* Of the students in the Nondegree Placed group, these are the students who actually enrolled in the nondegree basic skills courses they were eligible for.

4. *Nondegree to College-level Persisters:* Of the students in the Nondegree Enrolled group, these students persisted to one or more degree-applicable courses the semester following their enrollment in the nondegree basic skills courses.

Note: *Nondegree Enrolled Successful.* This group was not included in the original design but should provide useful information in future studies of disproportionate impact. It would include the students who enrolled in Nondegree basic skills courses and then monitor their success rates in the courses by special population status (i.e., age, gender, ethnicity and disability).

Procedure

The eleven colleges used different ethnic categories. To provide comparable data for this monograph, the ethnic data from the colleges was collapsed into five groups common to all of them. The number and percent of each ethnic group was calculated for the four subgroups listed above.

No calculation was performed for any of the ethnic groups that had fewer than 30 students. (For numbers below 30, the percentages would become too unreliable.)

Design 4 Format
This is the original Design 4 format presenting the percent increase/decrease from Tested to Nondegree Placed, from Nondegree Placed to Nondegree Enrolled, and from Nondegree Enrolled to College-level Persisters. Because colleges conducting disproportionate impact research invariably ask the question "How much of a difference represents disproportionate impact?" A 20% guide is presented with each "Design 4" table in an attempt to answer that question. This guide represents the percent that is within 20 percentage points of the reference population (e.g., the white group in ethnic comparisons). If the percent difference for a group is beyond this guide, a disproportionate impact may exist for that group and should be monitored more closely. The 20% guide was chosen because it flagged nearly the same groups as the EEOC guide explained below.

Results using the 20% guide should be viewed with caution when the number of students in any group drops below 30, when a group is represented in extremely large or small percentages, or when there is an

extremely large change in one group. A large change in one group will directly affect the proportions of the remaining groups.

EEOC Format

At Assessment workshops sponsored by the Chancellor's Office in Fall 1991, a suggestion was offered that Equal Employment Opportunity Commission (EEOC) guidelines may be useful in answering the question: How much of a difference makes a difference when monitoring for a disproportionate impact? EEOC guidelines were originally developed to monitor hiring practices and should provide some usefulness in monitoring differences related to disproportionate impact.

The EEOC guideline is most easily stated by describing how it is applied:

> If 50% of the tested students in the reference group (e.g., white) were eligible for degree-applicable basic skills courses, then other groups would be disproportionately impacted if they were represented in degree-applicable courses at less than 80% of the reference group (i.e., 80% of 50% is 40%). If only 35% of a special population tested group were eligible for degree-applicable basic skills courses, then this group would be said to be disproportionately impacted because it fell below 40%.

Data related to eligibility and enrollment in degree-applicable basic skills courses was needed for the EEOC calculations and was calculated by the author for each college to provide the information needed to apply the EEOC guidelines.

An 80% guide using the EEOC format is presented with each table. If a group falls below this proportion, it may indicate a disproportionate impact. A test for statistical significance between the two proportions is recommended to determine whether the numbers involved are sufficient to provide reliable proportions. Almost all proportions presented that are lower than the 80% guide are significant at the.05 level. The calculations were generated for all groups with numbers of 30 and higher.

Results

Eleven community colleges submitted their disproportionate impact studies related to reading, writing and math assessments for this monograph. They were from northern and southern California, representing primarily urban and suburban communities from all socioeconomic levels. A wide variety of reading, writing and math placement tests were represented.

There is an important distinction to keep in mind when reviewing the results in the following tables and generating one's own tables. When determining the 20% range for a disproportionate impact and nondegree basic skill classes, one would <u>add</u> points to the reference group's Percent Difference. Addition is the appropriate operation to determine the acceptable range when there is a concern about placing a barrier (e.g., placement in nondegree basic skills courses) in the student's path.

When calculating the 20% range for persistence to degree-applicable courses, one would <u>subtract</u> points from the reference group's Percent Difference because the concern is to determine if enough students in the special population groups are falling within the acceptable range.

The ranges to review for all of the tables are from the reference groups' Percent Difference to the indicated percentages for either the 20% or 80% guides. Percentages falling beyond this range would be indicative of a possible disproportionate impact.

I Tested to Nondegree Placed

Ethnicity: Design 4 Format Using College K Writing Data

PERCENT DIFFERENCES BY ETHNICITY
BETWEEN THE TESTED AND NONDEGREE PLACED GROUPS

ETHNIC GROUP	Column 1 Tested N	Column 1 Tested %	Column 2 Nondegree Placed N	Column 2 Nondegree Placed %	Difference in % Points Column 1&2* # Points	Percent Difference Column 1&2** %	20% Guide*** %
Asian	0	0	0	0	N/A	N/A	
Black	63	14	53	16	+2	+14	
Hispanic	112	25	90	28	+3	+12	
White	231	51	141	44	-7	-14	+6
Other	46	10	39	12	+2	+20	
Total	452	100	323	100			

* This calculation was done as follows: the percentage points difference is equal to (Col.2 % - Col.1 %) or for the Black group (16% - 14% = +2 percentage points).
** This calculation was done as follows: the percent difference is equal to [(Col.2 % - Col.1 %)/Col.1] x 100 or [(16 - 14)/14] x 100 = 14% difference.
*** The 20% guide was calculated as follows: The white reference group had a -14% decline in representation. Add 20% points to the -14% points and the guide is +6 percentage points (-14 + 20 = +6). Since Blacks, Hispanics, and Others are beyond the +6, there may be a disproportionate impact related to these groups.

Ethnicity: EEOC Format Using College B Writing Data

PERCENT DIFFERENCES BY ETHNICITY
BETWEEN THE TESTED AND DEGREE PLACED GROUPS

ETHNIC GROUP	Column 1 Tested N	Column 2 Degree Placed N	Col. 2 as a Percentage of Col. 1* %	80% Guide** %
Asian	253	130	51	
Black	270	66	24	
Hispanic	296	111	38	
White	863	531	62	50
Other	113	52	46	
Total	1795	890	50	

* This calculation was done as follows: (Col. 2/Col. 1) x 100 = percent of Col. 1 represented in Col. 2. For Asians this would be (130/253) x 100 = 51%.
** This calculation was done as follows: The white proportion was 62%. Eighty percent of 62% = 50%. Any nonwhite group with a proportion lower than 50% would be flagged using EEOC Guidelines as showing a possible disproportionate impact. Blacks, Hispanics and Others were beyond the 50% proportion and thus indicative of a possible disproportionate impact.

Age: Design 4 Format Using College H Reading Data

PERCENT DIFFERENCE BY AGE
BETWEEN THE TESTED AND NONDEGREE PLACED GROUPS

	Column 1 Tested	Column 1 Tested	Column 2 Nondegree Placed	Column 2 Nondegree Placed	Difference in % Points Column 1&2*	Percent Difference Column 1&2**	20% Guide***
AGE GROUP	N	%	N	%	# Points	%	
<20	217	11	123	12	+1	+9	
20-24	428	21	221	23	+2	+10	
25-29	487	24	214	22	-2	-9	
30-34	350	17	140	15	-2	-12	
35-39	213	10	90	9	-1	-10	
40-44	150	7	65	7	0	0	
45-49	104	5	45	5	0	0	
50+	99	5	56	6	+1	+20	0
Total	2,048	100	954	99			

* This calculation was done as follows: the percentage point difference using the 20-24 age group is equal to (Col.2 % - Col.1 %) or (23% -21% = +2 percentage points).

** This calculation was done as follows: the percent difference is equal to [(Col.2 % - Col.1 %)/Col.1 %)] x 100 or [(23 - 21)/21] x 100 = 10% difference.

*** Since the concern is age discrimination, one could calculate the 20% guide by starting with the 50+ age group and subtracting the 20% guide to see if there are any groups less than the result (e.g., +20 - 20 = 0). Three groups were lower than the guide and they were in the middle age groups rather than at the lower age groups. One could also collapse all the groups below 50 and compare their % difference with that of the 50+ group. This would put the 50+ age group 1% point beyond the 20% guide. The EEOC calculation would put the 50+ group just at the 80% guide. Because the data for age will be more confusing than the other comparisons, several ways of looking at the data are worthwhile.

Age: EEOC Format Using College H Reading Data

PERCENT DIFFERENCES BY AGE
BETWEEN THE TESTED AND DEGREE PLACED GROUPS

	Column 1 Tested	Column 2 Degree Placed	Col. 2 as a Percentage of Col. 1*	80% Guide**
AGE GROUP	N	N	%	%
<20	217	94	43	
20-24	428	207	48	
25-29	487	273	56	
30-34	350	210	60	
35-39	213	123	58	
40-44	150	85	57	
45-49	104	59	58	
50+	99	43	43	
Total	2,048	1,094		

* This calculation was done as follows: (Col. 2/Col. 1) x 100 or (94/217) x 100 = 43%.
** The trick seems to be figuring out which group to use when establishing the 80% proportion recommended by the EEOC guide. One suggestion is to collapse all the age groups below 50 and calculate the proportion for this group (it happens to be .54). When multiplied by 80%, the proportion is .43. The 50+ age group at 43% is just at this guide and so it would not be flagged as showing disproportionate impact.

Disability: Design 4 Format Using College H Writing Data

PERCENT DIFFERENCES BY DISABILITY
BETWEEN THE TESTED AND NONDEGREE PLACED GROUPS

GROUP	Column 1 Tested N	Column 1 Tested %	Column 2 Nondegree Placed N	Column 2 Nondegree Placed %	Difference in % Points Column 1&2* # Points	Percent Difference Column 1&2** %	20% Guide*** %
Disabled	83	5	51	5	0	0	
Not Disabled	1,706	95	908	95	0	0	+20
Total	1,789	100	959	100			

* This calculation was done as follows: the percentage points difference is equal to (Col.2 % - Col.1 %) or (5 - 5 = 0 percentage points difference).
** This calculation was done as follows: the percent difference is equal to [(Col.2 % - Col.1 %)/Col.1 %] x 100 or [(5 - 5)/5] x 100 = 0% difference. With such low initial percentages, it is useful to use 2 numbers beyond the decimal point to increase the precision of the calculation.
*** The 20% guide was calculated by adding 20% points to the Not Disabled percent (i.e., 0% + 20% = 20%). Since the Disabled group at 0% is well below the 20%, a disproportion impact does not appear to exist.

Note: Caution should be exercised in interpreting results when the percents are extremely high or low. In this case, using 2 digits beyond the decimal point provides a different conclusion than simply rounding the numbers. Also, when there are only 2 groups being compared rather than a number of groups, such as with ethnicity, the 20% guide is more apt to detect a difference.

Disability: EEOC Format Using College H Writing Data

PERCENT DIFFERENCES BY DISABILITY
BETWEEN THE TESTED AND DEGREE PLACED GROUPS

GROUP	Column 1 Tested N	Column 2 Degree Placed N	Col. 2 as a Percentage of Col. 1* %	80% Guide** %
Disabled	83	32	39	
Not Disabled	1,706	798	47	38
Total	1,789	830		

* This calculation was done as follows: (Col. 2/Col. 1) x 100 or (32/83) x 100 = 39%.
** The 80% guide was calculated as follows: Start with the Not Disabled percent and multiply it by .8 (e.g., 47% x .8 = 38%). Since the Disabled 39% is between the Not Disabled 47% and the 38% guide, no disproportionate impact appears to exist. If the numbers were large enough, the disability category could be broken down further into the 3 primary disability categories of communication, physical and other.

Gender: Design 4 Format Using College H Writing Data

PERCENT DIFFERENCES BY GENDER
BETWEEN THE TESTED AND NONDEGREE PLACED GROUPS

	Column 1 Tested	Column 1 Tested	Column 2 Nondegree Placed	Column 2 Nondegree Placed	Difference in % Points Column 1&2*	Percent Difference Column 1&2**	20% Guide***
GENDER	N	%	N	%	# Points	%	%
Male	688	35	437	40	+5	+14	
Female	1,296	65	654	60	-5	-8	+12
Total	1,984	100	1,091	100			

* This calculation was done as follows: the percentage points difference is equal to (Col.2 % - Col.1 %) or (40 - 35 = +5 percentage points difference).
** This calculation was done as follows: the percent difference is equal to [(Col.2 % - Col.1 %)/Col.1 %] x 100 or [(40 - 35)/35] x 100 = +14%.
*** The 20% guide was calculated by adding 20% points to the lowest percentage or -8% + 20% = +12%. Since 14% for males is beyond the 12% guide, there may be a disproportionate impact with more males being placed in nondegree basic skills writing classes.

Gender: EEOC Format Using College H Writing Data

PERCENT DIFFERENCES BY GENDER
BETWEEN THE TESTED AND DEGREE PLACED GROUPS

	Column 1 Tested	Column 2 Degree Placed	Col.2 as a Percentage of Col. 1*	80% Guide**
GENDER	N	N	%	%
Male	688	251	36	
Female	1,296	642	50	40
Total	1,984	893		

* This calculation was done as follows: (Col. 2/Col. 1) x 100 or (251/688) x 100 = 36%.
** If either males or females are represented in a greater proportion, the other group should then be within 80% of this percentage. The 80% guide is calculated as follows: Take the higher percentage and multiply by .8 (e.g., 50% x .8 = 40%). Since the proportion of males are not between 50% and 40%, they may be disproportionately impacted. The data from the 20% guide reflects a similar conclusion.

II Nondegree Placed to Nondegree Enrolled

Ethnicity: Design 4 Format Using College B Writing Data

PERCENT DIFFERENCES BY ETHNICITY
BETWEEN THE TESTED AND NONDEGREE PLACED GROUPS

ETHNIC GROUP	Column 2 Nondegree Placed N	Column 2 Nondegree Placed %	Column 3 Nondegree Enrolled N	Column 3 Nondegree Enrolled %	Difference in % Points Col. 2&3 # Points	Percent Difference Col. 2&3* %	20% Guide** %
Asian	123	14	40	10	-4	-29	
Black	204	23	101	26	+3	+13	
Hispanic	185	20	83	21	+1	+5	
White	332	37	138	35	-2	-5	+15
Other	61	7	31	8	+1	+14	
Total	905	100	383	100			

* This calculation was done as follows: The percent difference is equal to [(Col.3 % - Col.2 %)/Col.2 %] x 100 or as an example for the Asian group [(10-14)/14] x 100 = -29%.

** This calculation was done as follows: The white percent difference was -5. Twenty percentage points was added to this to get +15. Any group with a percent difference greater than +15 could represent a possible disproportionate impact. No groups were beyond the 20% guide of 15 indicating no disproportionate impact was found.

Ethnicity: EEOC Format

The EEOC format does not lend itself to this calculation. No data was provided on age, gender or disability for the Nondegree Placed/ Degree Placed to the Nondegree/Degree Enrolled groups.

III Nondegree Enrolled to Nondegree Persisters

Ethnicity: Design 4 Format Using College B Writing Data

PERCENT DIFFERENCES BY ETHNICITY BETWEEN
THE NONDEGREE ENROLLED AND NONDEGREE PERSISTER GROUPS

ETHNIC GROUP	Column 3 Nondegree Enrolled N	Column 3 Nondegree Enrolled %	Column 4 Nondegree Persisters N	Column 4 Nondegree Persisters %	Difference in % Pts. Col. 3&4 # Points	Percent Difference Col. 3&4* %	20% Guide** %
Asian	40	10	32	13	+3	+30	
Black	101	26	67	27	+1	+4	
Hispanic	83	21	51	20	-1	-5	
White	138	35	85	34	-1	-3	-23
Other	31	8	16	6	-2	N/A	
Total	393	100	251	100			

* This calculation was done as follows: The percent difference is equal to [(Col.4 % - Col.3 %)/Col.3 %] x 100 or as an example for the black students [(27 - 26)/26] x 100 = 4%.
** This calculation was done as follows: The white percent difference was -3. Twenty percentage points was subtracted from this to get -23. Any group with a percent difference lower than -23 could represent a possible disproportionate impact. No group was close to being disproportionately impacted.

Ethnicity: EEOC Format Example Using College B Writing Data

PERCENT DIFFERENCES BY ETHNICITY BETWEEN
THE NONDEGREE ENROLLED AND NONDEGREE PERSISTER GROUPS

ETHNIC GROUP	Column 3 Nondegree Enrolled N	Column 4 Nondegree Persisters N	Col. 4 as a Percentage of Col. 3* %	80% Guide** %
Asian	40	32	80	
Black	101	67	66	
Hispanic	83	51	61	
White	138	85	62	50
Other	31	16	52	
Total	393	251		

* This calculation was done as follows: (Col. 4/Col. 3) x 100. For Asians this would be (32/40) x 100 = 80%.
** This calculation was done as follows: The white proportion was 62%. Eighty percent of 62% = 50%. Any nonwhite group with a proportion lower than 50% would be flagged using EEOC guidelines as showing a possible disproportionate impact. No groups were lower indicating there was no observed disproportionate impact.

Note: The white proportion can be compared to the proportions of each nonwhite group and a test of significance run. This calculation is provided at the end of this monograph. All of the above proportions were significantly different than the white proportion at the .05 level. A difference can be significant and not represent disproportionate impact.

No data was provided on age, gender or disability for the Nondegree Enrolled to the Nondegree Persisters groups.

Discussion

I Nondegree Tested to Nondegree Placed

Relevant Data Extracted from the Tables
The following table represents data from nine colleges and indicates the number and percent of groups that were flagged as having a possible disproportionate impact.

	Writing N Flagged	Writing % Flagged	Reading N Flagged	Reading % Flagged	Math N Flagged	Math % Flagged	Total N Flagged	Total % Flagged
EEOC Format 80% Guide	18 of 26	69%	11 of 17	65%	5 of 13	38%	34 of 56	61%
Design 4 20% Guide	25 of 36	69%	12 of 15	80%	7 of 10	72%	44 of 61	72%

Comments
Sixty-one percent of the calculations using EEOC guidelines indicated a possible disproportionate impact across nine colleges and a variety of testing instruments for reading, writing, and math. Seventy-two percent indicated a disproportionate impact using the 20% guideline of Design 4.

Given these results, it appears likely that many colleges will have data that indicates a disproportionate impact on special populations between testing and eligibility for nondegree basic skills courses. It is a likely that it can be explained by examining the entering skill levels of students, colleges are required to respond when it occurs. Possible responses might be:

A. test the results for statistical significance,
B. recheck the calculations,
C. replicate the study,
D. develop a logical and reasonable rationale to fit the data,
E. monitor the situation over several semesters and increase the numbers in the groups,
F. gather additional demographic data to monitor other differences between the groups:
   •age ,
   •high school of origin,
   •gender, and so on.
G. demonstrate that the disproportionately impacted groups entered college with lower skills:
   •level of successfully completed writing, and/or math courses in high school,
   •high school GPAs,
H. check the validity data of the test,
I. summarize steps one has taken in a portfolio with the research report, and
J. change tests if it appears that special population groups enter the college with the same level of skills as the comparison group and are placed differently.

II Nondegree Placed to Nondegree Enrolled

Relevant Data Extracted from the Tables
The number of comparisons and the number flagged as having a disproportionate impact using the Design 4 Format is as follows:

Number of Comparisons	14
Number Flagged	3

Comments
Although the number of comparisons from four colleges is small, the data is encouraging. Very little impact to one group over another was found. Only 3 of the 14 (21%) comparisons raised the possibility of a disproportionate impact. Should a disproportionate impact be detected in this area, any of the activities or events that take place at a particular college between testing and enrollment may relate to differences in enrollment patterns and should be examined.

III Nondegree Enrolled to Nondegree Persisters

Relevant Data Extracted from the Tables
The number of comparisons and the number flagged as having a possible disproportionate impact are as follows:

	Design 4 20% Guide	EEOC 80% Guide
Number of Comparison	12	9
Number Flagged	0	0

None of the 12 Design 4 and 9 EEOC comparisons from three colleges indicated an impact as students moved from nondegree basic skills courses into college-level coursework. The EEOC format is particularly helpful in monitoring the persistence of nondegree basic skills students into college-level coursework because it shows the proportion of students who persist. Even if there is no disproportionate impact, it is still critical to know if nondegree students in general are making it to college-level courses. For example, out of 25 calculations involving 30 or more students, 17 of 25 (68%) nondegree groups had more than a 60% persistence rate to college-level work. Many of the groups approached 80%. This is a very positive finding. The data supports the underlying assumption of matriculation that the assessment of basic skills and referral to remedial coursework is beneficial to students in persisting toward their goals. More studies are needed before clear conclusions can be drawn; however, the current findings are quite encouraging.

Summary Comments

It appears that a variety of placement tests are picking up valid differences in the skills of underprepared students. Although a disproportionate impact was detected in the Tested to Nondegree Placed groups, colleges still need to provide additional information to substantiate why a particular group is being placed in different proportions. If a disproportionate impact is detected, one can recheck one's data, monitor the situation by replicating the study, show that there are initial skill differences between groups, demonstrate that the affected group(s) are not disproportionately impacted as they enroll and succeed in nondegree basic skills courses, and subsequently persist into college-level courses.

From the limited data available for this monograph there appears to be very little disproportionate impact between the Placed and Nondegree Enrolled, and between the Nondegree Enrolled and Nondegree Persisters to college-level work.

Of particular note is that 11 of 13 (85%) of the Nondegree Enrolled groups (with numbers of 30 and higher) had over 65% of the students persisting to college-level courses after one semester. Five groups were at or above 80%. This is very positive and encouraging support for the matriculation process and the programmatic efforts of colleges to serve underprepared students.

There were a few instances in which an ethnic group did not persist to college-level courses at a 65% or higher rate. If nondegree basic skills students, comprised of many underprepared ethnic minority students do not persist to college-level work, they may never achieve higher levels of education, so necessary for social equity. To the extent that any group, regardless of ethnicity, does not progress to college-level work, additional research needs to be conducted to determine why.

In hindsight, an additional comparison group would be extremely helpful when taking this "series of snapshots" as students progress from testing to college-level work. This would be to compare the outcomes of students who enroll in the nondegree basic skills courses by their special population status. Students who are successful or not in the courses could be tracked accordingly to monitor their subsequent performance in college. If the comparisons do not indicate a disproportionate impact as students proceed on to college-level work, then it indicates that the process is fair and equitable. In addition, one could examine student outcomes by other variables including method of instruction, student goal, amount of support, class size, and so on. By isolating the factors that affect student performance, targeted intervention becomes possible.

It is clear that ongoing research and monitoring of a disproportionate impact on special population groups is needed and should be a high priority on the research agenda of colleges, as should the monitoring of the nondegree basic skills students persistence to college-level work. Having the data broken down by ethnicity and other variables can help an institution focus its efforts on curriculum modification and innovative programs to respond to the needs of its underprepared students.

Formula for Calculating Significance of Differences between Proportions

If a difference between the white and nonwhite proportions are beyond the 80% guideline, one can check for the statistical significance for this difference using the following formula:

General Computational Formula

$$z = \frac{P_1 - P_2}{\sqrt{\frac{P_1(1 - P_1) + P_2(1 - P_2)}{N_1 + N_2}}}$$

If the Z score is = to +/-1.96, then the difference is significant at the .05 level.

Example:

P1 = Proportion of Tested Whites placed in degree math
P2 = Proportion of Tested Asians placed in degree math
N1 = Number of Tested Whites
N2 = Number of Tested Asians

Typical Spreadsheet Formula For Calculating the Z Score

= sum (B2 - C2)/SQRT(B2 * (1 - B2) + C2 * (1 - C2))/(D2 + E2)))

Typical spreadsheet formula to answer Yes of No if the value from the above formula is significant at the .05 level.

= If (or (D1 > 1.96, D1 < 1.96), "Yes", "No")

Enter P1, P2, N1, & N2 for a particular group in ROW 2
Enter the z score formula in F2
Enter the Yes/No formula in G2

Enter the P and N values for as many rows as you like and copy the F2 and G2 formulas down to go with these values and the spreadsheet will calculate each row and tell you whether the value is significant or not at the .05 level.

In the following example, the White proportion is compared to the proportions for the nonwhite groups. Remember that some of these differences may be significant but still be within the 80% EEOC guideline. The EEOC guideline is the White proportion of .53 * .8 = 42. Only the Asians are outside of the guideline even though the Black and Hispanic proportions are significantly different than the White proportion.

	A	B	C	D	E	F	G
1		P1	P2	N1	N2	Z Formula	Sig. @ .05 Yes/No Formula
2	Asian	.53	.34	2607	717	15.92	Yes
3	Black	.53	.48	2607	175	3.73	Yes
4	Hispanic	.53	.47	2607	690	4.88	Yes
5	White	.53	.53	2607	2607	0.00	No
6	Other	.53	.51	2607	264	1.52	No
7							

Using Chi Square for a Quick Check of Variability

One college used a Chi Square as a quick check to see if there were any differences worth pursuing between Degree and Nondegree Placed and between Degree and Nondegree Enrolled groups. Their data and its presentation are as follows:

Group	Total Tested	Degree Placed	Nondegree Placed
American Indian/Alaskan	41	16 (39%)	25 (61%)
Asian	177	97 (55%)	80 (45%)
Pacific Islander	20	10 (50%)	10 (45%)
Black	270	66 (24%)	204 (76%)
White	863	531 (62%)	332 (38%)
Hispanic	296	111 (38%)	185 (62%)
Filipino	56	23 (41%)	33 (59%)
Other	72	36 (50%)	36 (50%)
Total	1795	890 (50%)	905 (50%)

Chi Square = 140.20 significant at the .05 level.

Monograph on Design 5

Evaluating the Effectiveness of Remedial Placement

Prepared by Marty Dunlap

Abstract

The purpose of this design was to compare the performance and persistence of students who enrolled in and completed recommended remedial courses with students who did not enroll in the suggested courses. Students' placement data was used to identify those recommended to take remedial coursework. The study consisted of two groups of students: Advice Followers and Non-followers of Advice. The advice following group was divided further into those who completed the remedial course successfully and those who were not successful. Mean success rates, percent of units completed with grades of "C" or better, were calculated for each of the groups for the students' first term. The persistence rate to the subsequent term was determined for each group in addition to each group's mean success rate for the second term.

Five colleges provided their results for use in this monograph. Each college had small variations to the methodology of the design. The pattern of the outcome data for the five schools was fairly similar. The Advice Followers, as a group, had slightly higher success rates than the Non-followers of Advice. The Non-successful Advice Followers had much lower success rates than either the Successful Advice-followers or Non-followers of Advice. It is when persistence to the subsequent term was examined that differences start to appear between Advice-followers and Non-followers of Advice. A substantial difference in persistence rates exists between the Non-successful Advice Followers and the other two groups.

It appears that following advice is not as critical to student performance and persistence than is a successful experience with remedial coursework. Persistence may be a more sensitive measure to use when evaluating the effectiveness of recommended remedial coursework.

Introduction

The Matriculation Bill, AB 3, requires evaluation of the success rate of students who enroll in recommended courses compared to students who choose not to follow colleges' advice. The purpose of this design was to compare the performance and persistence of students who enrolled in and completed the recommended remedial courses with students who did not enroll in the suggested courses. The research question addressed is: Does successful completion of recommended remedial coursework assist students in their performance and persistence in college?

This study could have been conducted retrospectively utilizing existing college data. Students' initial placement information needed to be available in addition to student historical transcript records. This design is based on the supposition that students who completed the assessment component and received information on their placement were apprised of the college's recommendations regarding remediation either through a group interpretation of placement results during Orientation or a counseling session. This design could be used in evaluating the effectiveness of any remedial or developmental class, provided recommendations regarding remedial class enrollment were made to students.

Method

Design

The study consisted of two groups: the advice followers and the non-followers of advice. The measures of student success were the percent of units completed satisfactorily during their first term and students' persistence and performance in the following term. Variations to the design methodology will be presented with individual college's results.

Subjects

The students were those assessed and placed into the highest level of remedial reading. The sample should include only those students who participated in the college's matriculation activities (i.e., assessment, orientation and counseling) during a set period (e.g., Fall '88). This requirement did not hold true for the studies reviewed for this monograph. Unless otherwise noted in the *Results* section, colleges were not able to determine if the students participated in all of the matriculation activities, beyond the assessment component. An attempt was made to include a minimum of 200 students in the study who were placed in the specific level of remedial reading with nearly equal numbers of students enrolled in the recommended remedial course and not enrolled in the course.

Procedure

Students who were assessed during a set period and placed into the highest level of remedial reading were identified. Their transcript data was accessed to determine if they enrolled in and successfully completed the specific remedial course. Successful completion is defined as receiving grades of "CR", "C" or better. Students' transcript data was utilized further to determine persistence and performance in subsequent terms (e.g., units enrolled in, grades received).

Results

Outcome Measures

Each student's success rate was determined for his/her first term. Success rate is calculated by dividing the number of successful units (grades of A, B, C and CR) by the total number of units enrolled in (excluding IP, RD, AU and DR). Additionally, persistence to the following term was determined for each student. Persistence is said to occur when the student received a grade on her/his transcript for the subsequent term. The student's success rate for the following term also was calculated.

Analysis of the Data

The students placed in the highest level of remedial reading were divided into two groups, Advice Followers and Non-followers of Advice. The Advice Followers group was divided further into those who successfully completed (grades of "CR", "C" or better) one or more units in the remedial reading course and those who did not complete any units of the remedial course successfully. The mean success rate was calculated for each of the three groups for the initial term. The persistence rate to the next term also was calculated for each group. Persistence rate is defined as the percentage of students, from a specified group, who persisted to the following term. In addition, the mean success rate for the subsequent term was calculated for each of the groups.

Individual Colleges' Data

A letter soliciting research outcomes was sent to colleges who had indicated that they were going to pursue Design 5. Five colleges were able to provide statistical data by September 1991. Most of the reasons colleges stated for their inability to provide data had to do with the lack of a researcher. A summary of the information provided is presented below.

College A chose students who were first time students enrolled in the Fall '89 term. They examined students who were assessed and placed in their top two levels of remedial reading (N=588). The levels were combined to increase the sample size. Additionally, they expanded the study to include first time students who placed in their top two levels of remedial writing (N=449). There were two variations to their outcomes measures: units attempted was used to calculate the success rate which generally excludes CR/NC units and secondly, persistence was determined by enrollment in one or more Associate-degree applicable classes during the Spring '90 term. The tables presenting their outcomes follows:

College A

Success and Persistence of Remedial Reading Advice Followers and Non-followers of Advice

OUTCOMES

GROUPS	Number of Students	Fall 1989 Mean Success Rate	Persistence Rate to Spring 1990	Spring 1990 Mean Success Rate
Advice Followers:	195	49%	74% (144)	49%
Remedial Successful	108	76%	94% (102)	59%
Remedial Non-successful	87	14%	48% (42)	26%
Non-followers of Advice	393	43%	62% (244)	50%

College A

Success and Persistence of Remedial Writing Advice Followers and Non-followers of Advice

OUTCOMES

GROUPS	Number of Students	Fall 1989 Mean Success Rate	Persistence Rate to Spring 1990	Spring 1990 Mean Success Rate
Advice Followers:	224	43%	63% (141)	47%
Remedial Successful	126	71%	84% (106)	54%
Remedial Non-successful	98	6%	36% (35)	25%
Non-followers of Advice	220	43%	65% (143)	50%

College B chose to examine first time students who were assessed and placed in the highest level of remedial reading who enrolled in twelve or more units during the Fall '89 term (N=281). A variation in their outcome measure is that success rate was calculated on transfer and associate degree units only.

College B

Success and Persistence of Remedial Reading Advice Followers and Non-followers of Advice

OUTCOMES

GROUPS	Number of Students	Fall 1989 Mean Success Rate	Persistence Rate to Spring 1990	Spring 1990 Mean Success Rate	Persistence Rate to Fall 1990	Fall 1990 Mean Success Rate
Advice Followers:	107	77%	79% (85)	62%	55% (59)	64%
Remedial Successful	76	86%	87% (66)	64%	58% (44)	64%
Remedial Non-successful	31★	55%	61% (19)	57%	48% (15)	63%
Non-followers of Advice	174☆	72%	70% (121)	69%	41% (71)	71%

★ Six of these students withdrew from all their classes Fall 1989.

☆ Fourteen of these students withdrew from all their classes Fall 1989.

College C chose to examine students who completed the assessment during the Winter '90, Spring '90, Fall '90 and Winter '91 terms (N=952). Upon review of their report, it appears that these students represent those placed in one of their three levels of remedial reading. The results from the Fall '90 term (N=398) are presented below. This college surveyed the Fall '90 students who did not follow the college's advice to enroll in the reading course as to their reasons why they did not enroll. Seventy-nine students (16.6%) returned the survey with their most frequent first response being "I didn't know I needed it."

College C

Success and Persistence of Remedial Reading Advice Followers and Non-followers of Advice

OUTCOMES

GROUPS	Number of Students	Fall 1990 Mean Success Rate	Persistence Rate to Spring 1991	Spring 1991 Mean Success Rate
Advice Followers:	78	54%	67% (52)	51%
Remedial Successful	44	81%	86% (38)	54%
Remedial Non-successful	34	20%	41% (14)	41%
Non-followers of Advice	320	48%	77% (245)	51%

College D conducted a retrospective study on students who chose to participate in a specialized program for remedial students during the Fall '87 term. The program was for students who were assessed and placed in both remedial English and math classes. It is a voluntary program that includes: 1) guaranteed enrollment in a remedial math class, a remedial English class, a career development/awareness class and three optional classes, 2) on-going academic and career counseling, and 3) peer and faculty support in all classes. The results presented below are for students who chose to participate in the program and those who did not. It should be noted that the intervention variable of the study design (i.e., enrollment in a remedial reading course) is very different for this group of students. One variation to this college's study was to exclude students who: 1) withdrew from all their units, 2) attempted no units, or 3) had no GPA. Units attempted appears to have been utilized in calculating success rates, which generally excludes CR/NC units. CR/NC units do not contribute towards students' GPAs.

College D

Success and Persistence of Remedial Program Participants and Non-participants

	OUTCOMES					
GROUPS	Number of Students	Fall 1987 Mean Success Rate	Persistence Rate to Spring 1988	Spring 1988 Mean Success Rate	Persistence Rate to Fall 1988	Fall 1988 Mean Success Rate
Participants:	64	96%	86% (55)	97%	70% (45)	98%
Non-participants	48	96%	79% (38)	97%	65% (31)	96%

College E was able to forward only their statistical tables so it is not obvious what modifications may have been made to the study design. It is known, however, that they evaluated the native English language students separately from the English as a Second Language students. The results are presented below in two tables for these groups of students. Conclusive results can not be drawn due to the low number of students.

College E

Success and Persistence of Remedial Reading Advice Followers and Non-followers of Advice For English as Native Language Students

GROUPS	Number of Students	Fall 1989 Mean Success Rate	Persistence Rate to Spring 1990	Spring 1990 Mean Success Rate
		OUTCOMES		
Advice Followers:				
Remedial Successful	35	78%	86% (30)	55%
Remedial Non-successful	19	29%	74% (14)	49%
Non-followers of Advice	233	68%	78% (182)	61%

College E

Success and Persistence of Remedial Reading Advice Followers and Non-followers of Advice For English as Second Language Students

GROUPS	Number of Students	Fall 1989 Mean Success Rate	Persistence Rate to Spring 1990	Spring 1990 Mean Success Rate
		OUTCOMES		
Advice Followers:				
Remedial Successful	17	89%	82% (14)	46%
Remedial Non-successful	7	56%	57% (4)	68%
Non-followers of Advice	27	82%	78% (21)	73%

Discussion

The results are somewhat diverse for the five colleges providing data. Variations in methodology may have contributed towards this. When all Advice Followers are compared to Non-followers of Advice, there is not a large difference in success rates for the students' first term. Upon separating out the Successful students of the remedial course from the Non-successful students, a sizeable difference in success rates emerges with the Successful students being much more successful. It is important to note that the Successful students and Non-successful students have these same grades contribute, respectively, toward their success rates. In addition, some Non-successful students may have withdrawn from all of their courses.

Student persistence to the following term was higher for the Advice Followers compared to the Non-followers of Advice for four of the five schools. A remarkable difference in lower persistence rates is evident for the Non-successful remedial students compared to both the Successful remedial students and Non-followers of Advice. Concern was expressed by two colleges that the Advice Followers group should not have been split by the successful and non-successful students of the remedial course. This separation, however, does allow for a closer scrutiny of outcomes for remedial students. It provides an opportunity to examine these students in more detail supporting a growing belief within community colleges that remedial students who are not successful their first semester in college tend not to persist.

It appears that following advice or not in pursuing recommended remedial reading coursework may not be as critical to students' success as much as students' lack of success in their remedial courses. Using persistence as an outcome measure appears to be more sensitive in detecting the benefits of remedial coursework.

One college that continued to track these students for an additional semester found that the initial positive effects of the successful remedial coursework dropped off after the first term. One conclusion may be that the remedial course grade contributed noticeably to the success rates of these students for their first term. Another reason could be the remedial course served as a significant support to the students in the other courses they took that term. Since successful completion of one term of remedial coursework may not have a lasting effect, one could conclude that students who choose to follow colleges' recommendations are unique and may require continued attention beyond their first semester.

One important caveat to this study design, when interpreting the success and persistence of Advice Followers and Non-followers of Advice, is colleges' confidence in the validity of their assessment measures and cut scores resulting in accurate placement of their students when recommending remedial coursework.

Monograph on Design 6

History Course Success Based on English Eligibility

Prepared by Scot Spicer

Abstract

The California community colleges seek to maintain access and standards by providing basic skills curriculum to prepare students for college-level work. This paper reviews the findings from seven colleges which evaluated the impact of different levels of English language placement upon student performance in U.S. History, a transfer-level course. The findings demonstrate the necessity of conducting research prior to the adoption of prerequisite policies.

Introduction

Many courses at the community colleges require the demonstration of skills competencies prior to enrollment. This design provides a basic means for determining if a skills prerequisite is appropriate and at what level it should be set for a particular course. Typically, such prerequisites have been skill levels of English or math thought to be necessary for comprehending the central materials of the course. After the passage of AB 3, the Chancellor's Office established guidelines for assessment and placement to help students understand the basic skills needed for programs and coursework. The September 1989 Board of Governors' document on Title 5 regulations speaks of matriculation as "a program essential to and interrelated with the provision of basic skills instruction and rigorous course standards necessary to ensure student access and success."

The revised Title 5 requirements specify that reading, writing, computational, and critical thinking skills be demonstrated in courses leading to a degree. The goal, of combining assessment, placement, and counseling, is to aid the student in developing a comprehensive plan to achieve a particular educational goal based on his or her interests, abilities, and desires. To accomplish this objective of guiding students, a college needs to know what levels of skills are needed for success in various courses.

Method

This study was designed for colleges that: 1) have an English placement procedure based on student performance on standardized tests and related language evaluations and/or college coursework; 2) have completed Title 5 (strengthening standards) activities in the History Department; and 3) either do not have a prerequisite policy restricting entry into the outcome class, or restrict only a very few students at present. There are two major assumptions made in this study: 1) success in the history course requires students to demonstrate reading, writing, oral expression, and critical thinking skills as called for in Title 5 regulations; and 2) the student's English assessment and placement, and course completion reflect a measure of some or all of these abilities.

Design

The design called for a cohort study of students entering an institution for the first time in the fall and subsequently enrolling in the outcome course in either their first or second term. *U.S. History* was suggested as it is typically transferable and, for many schools, a requirement for the Associate Degree. The design could be used, however, for any course considering a basic skill as a prerequisite.

All students fitting the subject criteria should be considered. The data collected on each student included: *U.S. History* grades, English language placement level and English course completions, and additional variables such as gender, ethnicity, and age which are valuable for expanded studies.

Subjects

The subjects of the study were students attempting the outcome course following English assessment and/or completion of English courses. The study should evaluate ESL students separately for completion of appropriate ESL curriculum as well, but there may be additional issues in establishing ESL prerequisites for courses which will not be addressed in this effort.

Study Limitations

The design recommended a short-term cohort study to minimize the effects of elements other than the student's basic skills. Primary limitations are the accuracy with which English placement is determined and the demands made in the *U.S. History* course on the demonstration of Title 5 skills. If there are multiple paths of entry into the English curriculum, such as different tests, coursework, high school transcripts, etc., then each different method needs to be considered separately. Variations in instructors, course content, textbooks, and grading practices can significantly influence student outcomes.

Results

The tables presented below simplify the basic findings reported by the seven colleges who provided data. Each college has percentages representing the proportion of students who were successful (grades of A, B, C or CR) in the outcome course (*U.S. History*) by level of English placement based on assessment (Tables 1 and 2) or by highest level of completed English course (Table 3). "English 1A" is the designation for *Freshmen Composition*; "LB" is a designation for *level below*, so "1LB" designates a class one level below *Freshmen Composition*, and so forth.

U.S. History Course Success Based on English Placement in the Student's First Term

Table 1 compares the findings of three institutions on success in *U.S. History* relative to the students' English placement. Colleges A, B, and C studied students attempting *U.S. History* in their first term following completion of assessment. Evidence from colleges A and C indicates that one's level of basic English ability does have an impact on success in *U.S. History* at their institutions; that is, a higher initial level of English placement implied a greater chance of success in the outcome course.

Table 1
U.S. History Course Success By English Placement Level

Placement Level	College A	College B	College C
English 1A	85%	78%	78%
English 1 LB	31%	86%	64%
English 2 LB	21%	79%	50%
English 3 LB		63%	
	(N=107)	(N=316)	(N=199)

The data from College B suggests that assessed English abilities are not particularly related to success in the history course even though their results were statistically significant at the .05 level of confidence (unlikely to be random). Several possible explanations for this will be included in the Discussion section.

U.S. History Course Success in the Student's Second Term Based on Initial English Placement

Table 2 below compares the findings of two institutions relative to success in *U.S. History* during students' spring term following the students fall college entry and assessment. In both cases, the greater likelihood of success in *U.S. History* relative to higher initial English placement suggests a positive relationship between assessed English skills and the outcome course requirements.

Table 2
U.S. History Course Success By English Placement Level

Placement Level	College D	College E
English 1A	72%	77%
English 1 LB	48%	56%
English 2 LB	45%	22%
English 3 LB		
	(N=312)	(N=63)

U.S. History Course Success Based on English Course Completion

Table 3 below compares the findings of three schools who did retrospective studies for students in *U.S. History* who had entered their colleges over a period of time. This approach is also appropriate and may be more manageable given various data collection systems. In each case, the higher the prior level of English instruction mastered, the greater the probability of success in *U.S. History* when attempted. It should be noted that Colleges D and F compressed data from 1983 through 1990 in order to achieve large numbers. While this can be appropriate, these colleges should review their data year by year as Title 5 standards were "strengthened" during this time period and both history and English course standards may have changed. For College D, since their data from Table 2 (for one specific cohort) is rather similar, they probably will not find a problem. College G chose one semester and reviewed their students' prior English course completions.

Table 3
U.S. History Course Success By English Course Completion

Course Completed	College D	College F	College G
English 1A	81%	79%	76%
English 1 LB	64%	58%	56%
English 2 LB	48%	45%	46%
English 3 LB	38%		
	(N=838)	(N=518)	(N=426)

U.S. History Course Success by English Eligibility

Table 4 compares the results obtained from College D looking at their students in *U.S. History* related to English eligibility based on assessment results and course completions. Overall, the higher the English mastery evidenced by their students, the greater the probability of success in the *U.S. History* course. Additionally, the relative closeness of the numbers for the two eligibility routes, assessment and course completion, suggests that the English assessment and curriculum are well aligned. It is not surprising that students completing the course below English 1A, and thus eligible for 1A, are less successful than those initially eligible for 1A (see LARC studies). What is important is that at College D the English curriculum and placement practices seem well-integrated—students completing English 1LB increased the likelihood of their success in the outcome course by 16% over those placed into the English course but not taking English 1LB before the outcome course.

Table 4
College D
U.S. History Course Success By Student English Status

Student English Status:	
Completed English 1A	81%
Eligible for 1A (from Assessment)	72%
Eligible for 1A (by completing 1LB)	64%
Eligible for 1LB (from Assessment)	48%
Eligible for 1LB (by completing 2LB)	48%

Discussion

It is a common assumption that college-level English skills (reading, oral expression, and writing) are necessary to succeed in transfer and degree-applicable courses. Matriculation regulations require the demonstration of a relationship between skills and outcomes before implementing a mandatory prerequisite policy. Clearly, sound educational practice also would suggest the demonstration of such a relationship before implementation of advisory prerequisites. Design 6 is an initial research effort in guiding the establishment of prerequisites, but even more importantly, it is an invitation for faculty to discuss, define, and refine expectations of student performance and curriculum in both the English sequence and outcome courses.

College B with its ambiguous findings (see Table 1) provides a good example of research which calls upon the faculty to discuss standards. A couple of explanations can be suggested relative to their finding that the level of English placement did not particularly reflect on probable success in *U.S. History*. First, they found "statistical significance" for their outcomes distribution. This means that their students' history course outcomes vary from a purely random distribution between "success" and "non-success;" it does not mean that a significant correlation exists between the skills criterion and the outcome measure. Second, the lack of clear variation in the outcome criterion by English placement level suggests that there is a fault with one of the two major assumptions noted for this design, and we need to ask: "Do the individual history instructors conduct their classes in a way that requires Title 5 skills?" and "Is the English placement level a valid indicator of a student's relative ability?"

College B students were likely to be successful in *U.S. History* across all levels of English placement. These success rates can mean either: 1) their English placement is not separating students by ability levels; or 2) their *U.S. History* course does not require the skills measured by the English assessment process. Several of the institutions in this review specifically noted that the outcome course standards exhibited considerable variation across class sections and instructors; for example, some sections required term papers while others did not. Such a situation makes it very difficult to justify a prerequisite, advisory or mandatory.

Generally, the other six colleges all had some basis to suggest that English is an appropriate prerequisite for *U.S. History*. The challenge then is to determine whether to establish advisory or mandatory prerequisites and at what level. Most colleges seem to focus on either eligibility for English 1LB or English 1A for entry into transfer-level courses. Consequently, for discussion, let's suggest that eligibility for English 1LB be considered as a prerequisite for Colleges A, C, D, and E.

While data from Colleges C and D (see Tables 1 and 2) suggest that greater English mastery predicts success in the outcome course, the difference in probability of success between students at the 2LB and 1LB levels is not overwhelming: At College C, it's 50% versus 64%, and at College D, it's 45% versus 48%. College C indicates a significant increase in the probability of success with the 1LB eligibility over 2LB eligibility, but the probability of a 2LB student's success is still equal to chance, and at 50% why shouldn't they be allowed to try? These two institutions may need to strengthen their *U.S. History* course by making sure that term papers are assigned and tests require essay answers and critical thinking. Making the course more challenging for the lesser prepared students, which would be reflected in the colleges' future data, creates a sound rationale for requiring English 1LB as a prerequisite.

This author suggests a "2-to-1" ratio guideline for prerequisite recommendations: at least two-thirds of the students possessing the identified entry characteristic should be successful, while only one-third or less of the students without the entry characteristic should succeed. Using this guideline would allow College A an easy decision at making eligibility for English 1A their prerequisite; 85% of such students would succeed, while less than 31% of those below this level of English ability would succeed. For College E, eligibility for English 1LB would give them around 2/3's success and less than 22% of their lower students would be able to succeed.

Prerequisites help the institution be more effective and help insure student success, however, it is also clear that some able students would be excluded with the suggested prerequisites. Research on additional variables such as gender, age, ethnicity and high school of origin may also relate to success in *U.S. History*. These are not necessarily appropriate criteria for some sort of mechanical restriction on student enrollment. However, providing such information to counselors, who can discuss it with individual students and assist students in an appropriate final decision, makes for good practice.

For Colleges F and G, their data suggests a situation similar to that discussed for Colleges C and D. The data from these colleges show a clear increase in the probability of success for the outcome course with increased student mastery of English. However, between different levels of English course completion, the improvement is either not too great or it is so close to chance (50%) that it seems inappropriate to suggest such a prerequisite at this time. Again, standards in the history course can be strengthened to make English mastery more relevant as a predictor of success, or more refined research on additional student characteristics could better differentiate those who should be allowed access to transfer-level courses.

Monograph on Design 7

Student Access and the Implementation of Matriculation

Prepared by Richard Rasor

Abstract

The purpose of this study was to determine the impact of required matriculation activities upon student access to registration in the California community colleges. The study focused on access during the time period from admitted to college to registered for classes. The research questions were: 1) Have required matriculation activities (orientation, assessment, and counseling) made any difference in overall admission to registration rates? 2) Have required matriculation activities had a differential impact on ethnic groups in admission to registration rates?

Three reports were received, one with composite results for two colleges. Percentages were examined for new, non-exempt applicants who subsequently registered for classes. Data were broken out by ethnicity and by different times representing pre-, phase-in, and post-matriculation periods. There was no evidence in the findings of a disproportionate impact which adversely affects non-white students. Have matriculation activities made any difference in overall admission to registration rates? The question could not be satisfactorily answered due to somewhat mixed results. However, the trickle of evidence would suggest not.

Introduction

The purpose of this study was to determine the impact of required matriculation activities upon student access to registration in the California community colleges. The issue of access may be considered at different points in time: from community to applying for admission, or from submission of an application to registration for classes. This study focused on access only during the time period from admitted to registered.

The research questions posed by this study were:

1. Have required matriculation activities (orientation, assessment, and counseling) made any difference in overall admission to registration rates?

2. Have required matriculation activities (orientation, assessment, and counseling) had a differential impact on ethnic groups in admission to registration rates?

Method

Design

This approach examined the percentages of new, non-exempt applicants who subsequently registered for classes. Data were broken out by ethnicity and by different times representing pre-, phase-in, and post-matriculation periods.

Procedure

Several terms of all new freshmen applicants (admitted) who would normally be considered as "non-exempt" comprised the population (there were exceptions). It was necessary to establish three time periods; 2-4 academic terms before implementing matriculation, phase-in terms, and 2-4 terms after required matriculation activities were firmly in place. New, freshmen students for each of these terms were identified and their characteristics determined at time of (1) application and (2) registration.

Results

Only three reports were received, one with composite results for two colleges. Nevertheless, these reports reveal some of the difficulties colleges experienced in procuring meaningful data.

District A

This was a district report covering two colleges (aggregated results) during a phase-in (three terms) and a post-matriculation period (three terms). Data from a pre-matriculation period were not available. There was an overall drop by 1.8% from phase-in to the post period in admission to registration rates. The author stated that this was a small change. The rate for white students was a 1.8% decrease while the rate for non-whites averaged a 1.6% decrease.

Limitations: District A did not report sample sizes and had no pre-matriculation data.

College B

This college also was unable to gather data on a pre- or phase-in period of matriculation owing to the fact that all records of non-registrants were routinely purged. For the Spring 1990 semester, there were 295 new freshmen students who were admitted but did not register. Results indicated no differences for ethnic or gender groups between the student population and the non-registering group. Most non-registrants had moved during the time between admission and registration. Of those interviewed by telephone (44%), reasons given for not registering included employment, non-availability of desired course, and decision to attend another institution.

Limitations: Small sample, no pre-matriculation data.

College C

This particular college compared a pre-matriculation period with a phase-in period. Data were broken out by ethnicity. The overall difference was a gain (pre to phase-in) of 4.5%, the largest being for Hispanics, at 13.7%.

Limitations: Data restricted to two semesters.

The composite results from the three reports are presented in Table 1.

Table 1

Admission to Registration Rates (%) by Ethnic Groups

Ethnic Group / College	Pre-Matriculation	Phase-In Matriculation	Post-Matriculation
American Indian /Alaskan			
District A		62.5	59.4
College C	59.1	57.9	
Asian/Pacific Islander			
District A		62.9	59.0
College C	71.4	78.6	
Black			
District A		58.8	59.9
College C	59.9	61.1	
Hispanic			
District A		66.1	64.9
College C	60.4	74.1	
Filipino			
District A		63.0	64.4
College C	73.1	79.3	
White			
District A		67.4	65.6
College C	72.5	74 .0	
Other			
District A		64.1	60.5
College C	76.2	71.4	

Discussion

With District A, the differences in admission to registration rates (phase-in to post-matriculation) indicates a decrease of 1.8% for whites and 1.6% for non-whites. In College C, the difference in pre- to phase-in periods indicates and increase for whites of 1.5% and 5.4% for non-whites. Thus, there is no evidence at three colleges of a disproportionate impact which adversely affects non-white students. Has matriculation activities made any difference in overall admission to registration rates? The question cannot be satisfactorily answered due to somewhat mixed results. The trickle of evidence would suggest not. One of the main difficulties in conducting research of this nature is, for the most part, colleges do not retain applicants' files when they don't register; generally, the files of non-registrants are purged. Colleges would need to maintain applicant files in order to effectively monitor access in this fashion.

Monograph on Design 8

Monitoring Changes in Student Goal Before and After Matriculation

Prepared by Jon Kangas

Abstract

This design was aimed at the following research question: Do students change or clarify their goals after participating in assessment, orientation, and counseling/advisement activities?

The data highlights for College A were as follows:

- *83% of the students changed their goals from admission to matriculation.*
- *68% had undecided as an initial goal; only 6% were undecided after matriculation.*
- *15% chose transfer with an AA/AS before matriculation; 58% after.*
- *29% chose a transfer or degree related goal upon admission; 74% after matriculation.*
- *Only 1% stated certificate as a goal initially; 2% after matriculation.*

The data highlights for College B were as follows:

- *35% of the students were undecided at admission; only 10% after matriculation.*
- *64% of undecided students changed to an AA/AS goal, 17% to AA without transfer, and 9% to transfer without degree.*
- *Transfer with an AA degree was a goal of 35.4% at admission; 47% after matriculation.*
- *53% had a transfer or degree-related goal upon admission; 77% after matriculation.*

Both colleges had large numbers of undecided students. After matriculation, the number of undecided students was reduced dramatically. Degree and transfer were the most commonly chosen goals by the undecided students. The fact that 83% of the students changed their goals at one college lends evidence to the hypothesis that matriculation activities help students clarify their goals. Goal clarity is assumed to contribute positively to retention. If goal changes relate to goal clarity, then this change rate is very positive. It was seen as critical that pre- and post-goals be identical and that they be collected at admission and just after counseling/advisement. The colleges emphasized the need to facilitate goal clarification prior to registration rather than during the students' first semester after course selection had taken place. More pre-post goal studies are needed to help demonstrate that matriculation activities are effective in helping students clarify and select their educational goals.

Introduction

This design was aimed at answering the following research question: Do students change or clarify their goals after participating in assessment, orientation, and counseling/advisement activities?

The matriculation process is intended to help students clarify their goals and to develop a plan to reach those goals. A more efficient use of educational resources is one desired outcome for this process. Greater retention of students also is believed to occur when students have a clearer vision of their goals.

Method

Design

This study was designed for colleges who were able to collect student goal information at the time of admission (MIS goal SB14) and again just after the pre-enrollment matriculation activities conclude (MIS goal SM01). This was seen as a form of student goal pre- and post test to determine the effect of the matriculation process on student goal selection.

The goal collected during the admission process is referred to as the Admission goal.
The goal collected after the matriculation process is referred to as the Matriculation goal.

MIS goals are as follows:

Obtain a bachelor's degree after completion of an associate degree - BA & AA
Obtain a bachelor's degree without completing an associate degree - BA w/o AA
Obtain a two-year associate degree without transfer - AA w/o Transfer
Obtain a two-year vocational degree without transfer - Voc. AA w/o Transfer
Earn a vocational certificate without transfer - Cert. w/o Transfer
Discover/formulate career interest, plans, goals - Discover Interests
Prepare for a new career (acquire job skills) - Prepare Career
Advance in current job/career (update job skills) - Advance Career
Maintain certificate or license (e.g. Nursing, Real Estate) - Maintain Cert./Lic.
Educational development (intellectual/cultural) - Educ Dev.
Improve basic skills in English, reading or math - Improve Bas. Sk.
Complete credits for high school diploma or GED - Complete H.S. units
Undecided on goal - Undecided

Subjects

The original design suggested that colleges have students state the admission goal during the admission -process and the matriculation goal just after counseling. Students who filled out both goal statements would be the subjects in the study.

Results

How to Read the Tables

Neither college was able to replicate exactly Design 8 in matching the students' Admission goals with the Matriculation goals. The colleges did not have identical listings of both sets of goals for students to choose from.

1. Read the row totals on the far right. This gives the numbers and percents for each of the Admission goals.
2. Read the column totals along the bottom. This gives the numbers and percents for each of the Matriculation goals.
3. When data is presented as portrayed in the original design, the tables can be read as follows: Look at the diagonal that runs from the top left to the bottom right. This represents the number and percent of the time that students chose the same goals after matriculation activities as they chose upon filling out their applications for admission. The numbers and percents in the other columns for that row reflect which goals the students chose instead of their initial choice.

   When the Admission and Matriculation goals are not identical, this analysis is not possible. A diagonal line can be drawn in for College A, but not for College B.

College A had the closets match between Admission and Matriculation goals but did not use the MIS goals. College B had the one set of goals for Admission and the MIS goals for Matriculation. Using the MIS goals for both is ideal.

College A

Nine-hundred and seven students for Spring 1990 were asked to state their admission goals. At the end of the semester, matriculated students were asked to state their matriculation goals.

The data highlights for college A are as follows:

- 83% of the students changed goals from their admission goals to the matriculation goals.
- 68% had undecided initially as a goal; only 6% were undecided after matriculation.
- 15% chose transfer with an AA/AS before matriculation; 58% after.
- 29% chose a transfer or degree-related goal upon admission; 74% after matriculation.
- Only 1% stated certificate as a goal initially; 2% after matriculation.

The following two tables are close to the ones presented in Design 8. Because of the pre- and post goals were not identical, an attempt was made by the college researcher to match them as much as possible. The two tables display the numbers and percents of students choosing admission goals and indicate how they did or did not change as they chose matriculation goals.

College A

Table 1

Number of Students Who Chose Admission Goals Who Later Chose Matriculation Goals

Matriculation Goals

Admission Goals	Transfer and AA	Transfer w/o AA	AA w/o Transfer	AS w/o Transfer	Certificate	Other (Table 3)	Blank	Admission Goal Totals
Transfer and AA	95	11	4	9	1	7	6	133
Transfer w/o AA	36	13	6	1	0	4	0	60
AA w/o Transfer	14	4	4	5	0	3	6	36
AS w/o Transfer	17	1	0	6	2	2	2	30
Certificate	4	0	0	2	0	1	0	7
Job Skills	9	1	1	2	1	2	4	20
Undecided	349	86	31	48	9	59	39	621
Matriculation Goal Totals	524	116	46	73	13	78	57	907

College A

Table 2

Percent of Students Who Chose Admission Goals Who Later Chose Matriculation Goals

Matriculation Goals

Admission Goals	Transfer and AA	Transfer w/o AA	AA w/o Transfer	AS w/o Transfer	Certificate	Other (Table 3)	Blank	Admission Goal Totals
Transfer and AA	71%	8%	4%	7%	1%	5%	4%	15%
Transfer w/o AA	60%	21%	10%	2%	0	7%	0	7%
AA w/o Transfer	39%	11%	11%	14%	0	8%	17%	4%
AS w/o Transfer	56%	3%	0	20%	7%	7%	7%	3%
Certificate	57%	0	0	29%	0	14%	0	1%
Job Skills	45%	5%	5%	10%	5%	10%	20%	2%
Undecided	56%	14%	5%	8%	1%	10%	6%	68%
Matriculation Goal Totals	58%	13%	5%	8%	1%	9%	6%	100%

College B

Eighteen-hundred and ninety nine students for Fall 1990 indicated both admission and matriculation goals.

The data highlights for the college B were as follows:

- 35% of students were undecided at admission; only 10% after matriculation.
- 64% of the undecided students changed to an AA/AS goal, 17% to AA without transfer, and 9% to transfer without degree.
- Transfer with an AA degree was a goal of 35.4% at admission; 47% after matriculation.
- 53% had a transfer degree related goal upon admission; 77% after matriculation.

College B

Table 1

Number of Students Who Chose Admission Goals Who Later Chose Matriculation Goals

	Matriculation Goals												
Admission Goals	Transfer no Degree	Transfer w/AA/S	Voc Degree	AA w/o Transfer	Maintain Certificate	Prepare Career	H.S. Diploma	Undecided	Discover Career	Advance Career	Education Develop	Basic Skills	Admission Goal Totals
Transfer No Degree	36	97	0	11	1	0	1	13	0	0	1	1	161
Transfer w/ AA/S	71	427	8	81	9	1	4	51	4	0	3	1	660
Vocational Degree	0	3	3	12	11	0	1	5	0	0	0	0	35
Liberal Arts Degree	5	29	1	78	10	3	5	20	0	0	1	1	153
Vocational Certificate	0	14	7	21	50	1	3	17	0	1	1	0	115
Job Skills	1	24	2	22	28	1	3	12	0	1	7	1	102
Undecided	61	316	11	112	47	2	24	65	6	2	18	9	673
Matriculation Goal Totals	174	910	32	337	156	8	41	183	10	4	31	13	1899

College B

Table 2

Percent of Students Who Chose Admission Goals Who Later Chose Matriculation Goals

	Matriculation Goals												
Admission Goals	Transfer no Degree	Transfer w/AA/S	Voc Degree	AA w/o Transfer	Maintain Certificate	Prepare Career	H.S. Diploma	Undecided	Discover Career	Advance Career	Education Develop	Basic Skills	Admission Goal Totals
Transfer No Degree	1.9	5.1	0	0.6	0.1	0	0.1	0.7	0	0	0.1	0.1	8.5
Transfer w/ AA/S	3.7	22.5	0.4	4.3	0.5	0.1	0.2	2.7	0.2	0	0.2	0.1	34.8
Vocational Degree	0	0.2	0.2	0.6	0.6	0	0.1	0.3	0	0	0	0	1.8
Liberal Arts Degree	0.3	1.5	0.1	4.1	0.5	0.2	0.3	1.1	0	0	0.1	0.1	8.1
Vocational Certificate	0	0.7	0.4	1.1	2.6	0.1	0.2	0.9	0	0.1	0.1	—	6.1
Job Skills	0.1	1.3	0.1	1.2	1.5	0.1	0.2	0.6	0	0.1	0.4	0.1	5.4
Undecided	3.2	16.6	0.6	5.9	2.5	0.1	1.3	3.4	0.3	0.1	0.9	0.5	35.4
Matriculation Goal Totals	9.2	47.9	1.7	17.7	8.2	0.4	2.2	9.6	0.5	0.2	1.6	0.7	100.0

Discussion

Given the current emphasis on increasing student transfers, coupled with the matriculation goal of increasing colleges' efficiency by having students choose educational goals, the two studies reviewed are quite encouraging.

Both colleges had large numbers of undecided students. After matriculation, the number of undecided students was reduced dramatically. Degree and transfer goals were the most likely choices of the undecided students. This should be a positive contribution to the transfer effort.

The fact that 83% of students changed their goals at one college lends evidence to the hypothesis that counseling and matriculation help students clarify their goals. Goal clarity is assumed to contribute positively to retention. If goal changes relate to goal clarity, then this change rate is very positive.

The college that collected goals at the end of the semester concluded that it would be extremely helpful to provide counseling prior to initial enrollment in order to help the large number of undecided students clarify their goals prior to their first registration. This is an extremely positive suggestion and supports an underlying assumption of the matriculation process that these activities need to occur prior to initial registration.

Two studies certainly aren't conclusive. However, the results are very positive and encouraging. The following recommendations from the two colleges should be helpful to others attempting this design:

1) Collect the matriculation goal soon after the initial matriculation activities are concluded.

2) Use the same list of goals for admission and matriculation to make comparisons possible. (This is why SB14 and SM 01 in the MIS data element dictionary are identical.)

3) Help students clarify their goals prior to initial registration.

Tabulating the data as reflected in the *Results* section is a helpful way to keep track of goal changes and the direction of the changes.

More pre-post goal studies are needed to help demonstrate that matriculation activities are effective in helping students identify their educational goals.

Monograph on Design 9

Student Satisfaction With Matriculation

Prepared by Scot Spicer

Abstract

This is an effort to review some of the student satisfaction survey data collected throughout the state related to evaluation of matriculation activities. A few general trends have been noted: a majority of students are satisfied with colleges' support services; matriculation services have empowered students to select goals; matriculation activities appear to have given students confidence and awareness with which to pursue their goals; and institutions have become more aware of differences between student population groups and their subsequent reactions to services.

Introduction

This study attempted to respond to state directives about students access to, awareness of, and satisfaction with specific campus services related to the matriculation process. This design also may be used to demonstrate the impact of matriculation on a college's services. The ability of students to make "wise educational choices" requires the use of services and then the application of the information they receive to their decision making. The design sought to determine if students who participated in matriculation activities: 1) demonstrated more understanding and direction within college, and 2) had greater awareness of, use of, and satisfaction with matriculation activities and other support services.

Method

With data collected by survey instruments, the studies examined student perceptions of and satisfaction with matriculation services. Institutions had the option of using the materials provided with the original design as their survey instrument or using the materials to assist them in the development of their own survey instrument. Ultimately, the goal is to have ongoing survey activities to support the evaluation of matriculation and better serve students' needs.

Design & Subjects

In developing this monograph, twenty-five reports from individual institutions and districts were reviewed. Each set of materials sought to evaluate matriculation services or practices. Several reports failed to specify the study population (possibly because raw data was sent rather than complete research reports), and many institutions developed unique instruments which made grouping or comparison difficult. Therefore, some reports will not be reflected within this monograph. Four institutions mailed surveys out to a sample of students; three conducted surveys to obtain opinions from new students only; five evaluated the perceptions of students who completed an orientation course; and eleven colleges (or districts) did surveys across their entire student populations. Several colleges were assisted by outside consultants, and one study was done completely by an outside consulting group. The sample sizes varied from under 200 to over 2,000.

Study Limitations

Any survey project is only as good as the clarity of its questions, sampling representativeness, and student truthfulness. Consequently, the use of review committees and piloting were recommended in the design, and most of the reports reviewed provided evidence that one or more of these suggestions were followed. In a couple of cases, plans to reach specific populations were thwarted by a lack of responsiveness from the targeted group(s).

Results

Most of the survey projects attempted to gather opinions at the end of a term, usually the spring term. One institution studied their summer session matriculants. Most efforts surveyed students in a classroom setting, but a few used mail surveys to reach students at home. Most projects focused on large samples with the possibility of studying sub-samples, although several targeted various sub-populations.

Mail Surveys

All the *mail surveys* reached small samples. In two cases, however, the sample size and general characteristics of the sample population were such that the institutions felt they could infer reasonable conclusions from the data. The sample sizes ranged from 85 to 434 with response rates of 14%, 15%, 17%, and 27%. Only the college with the highest response rate came close to following a standard protocol for mail surveys: they made advance contact with the intended respondents and followed up after the survey instrument had been sent. The low response rates of the other three colleges, especially given the size of the population they hoped to make generalizations about, made confidence in the results difficult.

Among the mail surveys, results indicated that most services were rated as good or excellent by two-thirds of the respondents. The responses indicated that both orientation and counseling helped students refine their goals and choose classes. Even at the institution with the lowest response rate, the differences between responses from *matriculated* students and *non-matriculated* students were so great that the author concluded with "some degree of certainty" that matriculation appears to have successfully integrated students into the college environment. One institution did have a very negative rating for their mail-in registration. Over half of the students rated the mail-in registration process as "poor."

Evaluation of Orientation Classes

Four institutions sought to evaluate the impact of an orientation class on students. The nature of these orientation classes varied from a workshop series prior to enrollment to short- and full-term classroom experiences. These institutions surveyed students late in the academic term to gather impressions; one did not identify a sample size, the others reported 99, 113, and 236 respondents. Comparison of the results across colleges is limited by the variation in survey items among the institutions, however, the classes clearly seem to assist students in defining and clarifying their goals and academic programs.

College A provided evidence that a majority of their students felt that counseling had helped them select the right courses. A majority of their students also said that the orientation had helped them feel more comfortable about attending the college. College B compared "fully-served" students, those who had completed the orientation course, with those who had not. This institution found that the fully-served group had a 20% higher persistence to a second term and that these students were several times more likely to have completed all assessment tests and discussed study habits, degree requirements, and transfer requirements with a counselor.

Colleges C and D asked students participating in their orientation classes to rate the various services provided. College C found that 78% to 90% of the participants were satisfied with the information provided about support services, procedures, and life skills. This college also found that 80% of the students believed they gained a clearer understanding of how to plan their studies and 82% thought they had been assisted in clarifying their goals. College D reported that 94% of the students felt the class had helped them to clarify their goals, and 97% felt the academic planning component of the class had been good or excellent. College C also found that non-high school graduates were the most satisfied with their experiences and that reactions varied somewhat among ethnic groups.

Surveys of New Students

Three studies sought to collect the impressions and opinions of new students about their experiences with the matriculation components. Colleges E and G surveyed students late in the term, while College F surveyed students towards the end of the enrollment process. Selected findings included:

College E had a sample of 174 students, reporting:

- 63% rated Admissions as good or excellent.
- 76% rated treatment by Admissions personnel as good or excellent.
- 62% rated the helpfulness of Counseling as good or excellent.
- 20% reported that Orientation helped them choose classes.
- 52% felt their placement results were appropriate.

College F with a sample of 805 students, indicated:

- 80% were satisfied with the instructions on how to register.
- 93% felt the student handbook was helpful or very helpful.
- 56% rated the counselors as good or excellent in terms of showing interest and concern.
- 91% felt the assessment tests were given in a fair manner.
- 75% felt the assessment tests helped them select their courses.
- 74% to 77% felt their assessment provided a good indicator of their math, English, and reading skills.

College G included the following in their report on 750 students:

- 92% agreed the Admissions process was easy to understand.
- 89% agreed the Admissions process was fairly convenient to go through.
- 92% agreed that Orientation was helpful.
- 93% agreed that they were better informed about the availability of support services at the college as a result of Orientation.
- 86% agreed that the counselor had helped them to clarify their educational goals.
- 83% agreed that they had a clear sense of how their assessment test scores related to course placement.

The finding from these colleges generally reflect a high level of student satisfaction with the matriculation process and indicate that the process helped students clarify the necessary paths to achieve their educational goals. In each of these cases, while the findings reflected high levels of student satisfaction, the schools also identified areas where they could improve their services.

Campus Wide Student Surveys

Partial results of surveys from five colleges are reported on the next page. Three medium to large urban/suburban institutions within about twenty-five miles of each other in southern California conducted similar campus service questionnaires during spring terms over the past three years. Two rural colleges in northern California counties also conducted similar surveys in the same time period. Because each institution organizes its services differently, six support services which seem to be comparable are listed for each with the recognition, usage, and satisfaction ratings reported at each institution. "Recognition" is the percentage of students who report they know of a service. "Usage" is the percentage of students who report having used the service. "Satisfaction" is the percentage of those using the service who report a positive experience. While the surveys were administered in different years, each provides a large sample of students surveyed since the implementation of matriculation funding. The similarity of the reported service recognition between these institutions is striking, as are the high levels of student usage and satisfaction with services. College K might wish to review how they inform students about availability of support services, and each institution had areas where satisfaction could be improved.

Recognition Level of Student Services by Institution

	SUB/URBAN COLLEGES			RURAL COLLEGES	
	College H Spring '89	College I Spring '90	College J Spring '91	College K Spring '90	College L Spring '91
STUDENT SERVICES	N=1,253	N=972	N=1,241	N=517	N=540
Career Counseling	86%	91%	91%	61%	95%
Job Placement	87%	90%	89%	52%	91%
Academic Counseling	82%	95%	89%	94%	97%
Transfer Center	81%	79%	83%	57%	71%
Financial Aid	90%	91%	93%	90%	96%
EOPS	69%	58%	64%	38%	80%

Usage Level of Student Services by Institution

	SUB/URBAN COLLEGES			RURAL COLLEGES	
	College H Spring '89	College I Spring '90	College J Spring '91	College K Spring '90	College L Spring '91
STUDENT SERVICES	N=1,253	N=972	N=1,241	N=517	N=540
Career Counseling	23%	25%	38%	18%	38%
Job Placement	27%	22%	20%	13%	27%
Academic Counseling	52%	63%	54%	65%	78%
Transfer Center	30%	20%	19%	17%	21%
Financial Aid	26%	24%	22%	26%	46%
EOPS	23%	15%	10%	12%	19%

Satisfaction Level of Student Services by Institution

	SUB/URBAN COLLEGES			RURAL COLLEGES	
	College H Spring '89	College I Spring '90	College J Spring '91	College K Spring '90	College L Spring '91
STUDENT SERVICES	N=1,253	N=972	N=1,241	N=517	N=540
Career Counseling	76%	83%	89%	81%	72%
Job Placement	73%	75%	74%	81%	70%
Academic Counseling	73%	82%	88%	79%	65%
Transfer Center	79%	80%	83%	77%	73%
Financial Aid	71%	85%	77%	68%	75%
EOPS	86%	88%	86%	83%	81%

We would expect to see some variation in results due to the size and physical layout of the different institutions. If student service units are near each other, students are more likely to be aware of each if any are used. It also should be noted that "counseling" typically takes place in one major unit, but auxiliary units such as EOPS, Disabled Students, etc., also handle counseling. Also, the local community and economy will have an impact on the importance of units like EOPS and Financial Aid.

Multi-campus and Multi-site Surveys

Three reports provided information from surveys conducted at different colleges within one district or multiple delivery sites by individual colleges. In each case, the responses reflected consistent basic trends demonstrating that the institutions were providing "welcome" services to students, but variation did exist and as such called attention to the delivery of services at certain campuses and/or at off-campus sites. These reports provide an opportunity for the institutions to study intra-district variations and attend to the provision of comprehensive services to all students with consideration to demographic variables.

Overall Component Evaluation

One goal of matriculation evaluation is institutional improvement. There is, however, a need to establish a reference point to determine if the students' expressions reflect excellence or mediocrity: Is a satisfaction rating of 65% good or only fair? Comparing across institutions, in the same region or of similar size, gives such reference points and provides weight to student comments. The following are generalized findings by matriculation component for the colleges submitting materials for this review.

Admissions
Most institutions gave students the opportunity to rate the admissions process, its convenience, and the helpfulness of the admissions staff. Generally, 65% to 85% of students found the admissions process convenient, the staff helpful, and rated their experience as good or excellent.

Orientation
Orientation activities seemed to have the highest variation of impressions with a range from about 20% to 90% indicating satisfaction with different aspects of orientation. The medium of orientation varies from printed materials to videos to courses. Consequently it should not be too surprising that its impact can vary widely.

Assessment
Three key questions were common to an evaluation of the assessment component of matriculation. First and foremost, were students satisfied with their course placements/did they feel their course placement was accurate? Typically, colleges reported 65% to 75% of their students affirming their English and math course placements as appropriate. Some institutions reported that over 80% were satisfied, while a couple of colleges reported a satisfaction rate of less than 55%. Student dissatisfaction with placement typically ran around 10%, with 20% about the highest level indicated. Several colleges recognized that a lack of satisfaction or high dissatisfaction could reflect the availability and clarity of information explaining assessment results to students. It is also possible that the placements were not appropriate and/or valid; reviewing student satisfaction of their placement results as a portion of placement validity seems appropriate.

Institutions found that 65% to 75% of their students usually found assessment results helpful in selecting courses, and 75% to 90% of the students thought the tests were "fair." Again, a couple of cases arose where only about half of students found the assessment results to be "helpful" and/or "fair." One such institution seemed to have a problem with the conditions under which the tests were given.

Advisement/Counseling
Perhaps the widest array of questions for a single component addressed the counseling function. Generally, 45% to 65% of students rated the counseling experience as good or excellent. Sixty to eighty percent of the students also noted that advisement had helped to clarify their goals.

Student Goal Identification

All surveys, which included questions on the impact of the various components of matriculation (assessment, orientation, and counseling) on students' initial course selection and goal identification, found that they did, usually to a high degree. Another element in a student's goal identification process is the "feedback" s/he receives from completing courses and the use of support services. Below are listed the top three reasons students at five colleges identified as leading them to change their goals after a passage of time. These five institutions reflect the diversity of the students attending California's community colleges. The responses seem to indicate that *information* from support services and instruction is playing the dominate role in refining students' directions and goals. While the wording of each instrument varied somewhat, the top response was given by 7% to 35% of the respondents at the indicated institutions.

Top Reasons Given By Students For Goal Changes

College M
1) Discussions with a counselor.
2) The results of tests I took when I enrolled in school.
3) I did not do as well as I expected in the courses I selected.

College K
1) Potential job opportunities (in another area).
2) Enjoyment of different kinds of courses.
3) Discussions with instructors.

College N
1) Found another more enjoyable (goal).
2) Counselor.
3) Not enjoying classes in major.

College L
1) Discovered an area of study that I enjoyed more.
2) Discussions with other students.
3) Job/career opportunities in another area were of greater interest to me.

College H
1) Discovered an area of study that I enjoyed more.
2) Job/career opportunities in another area were of greater interest to me.
3) Found I did not enjoy the courses in the major originally selected.

Discussion

One goal of evaluation is institutional improvement. Conducting student satisfaction surveys provides valuable input from students and when tracked over time can give institutions feedback on their efforts to change services in order to better meet the needs of students. The opinions collected from students over the last several years, after the initiation of matriculation funding, show high levels of recognition, use, and satisfaction with college services. Students also demonstrated the intent of matriculation reform by using assessment, career information, and counseling services to identify and pursue their goals. Overall, these studies have assisted the colleges in planning and evaluating their matriculation and related support services. Further research and more analysis, such as variation in responses by age, gender, and ethnic groups, will provide additional information for institutions and begin a new phase of student satisfaction evaluation.

While colleges are clearly meeting the overall matriculation mandate, orientation seems to be one area where colleges are especially challenged, as reflected in the variations of student responses about orientation. The challenge may be related to asking students two different kinds of questions: How would they evaluate an "orientation" session? and How would they evaluate their orientation to college? An orientation session may be as simple as an explanation of the matriculation process; it also may be a semester long course including counseling and career-planning. While orientation may be a "component" of matriculation, it also is the summation of the new student's matriculation experiences, and it needs to be carefully crafted within the process.

The general findings regarding orientation to college warrant an effort to insure that a high level of information, disseminated by whatever means, is available to each new student. Orientation can make students aware of support services, clarify and assist in course selection, and make the undertaking of college more comfortable. Orientation to college also seems to be particularly important for the non-traditional and least prepared students. Orientation to college can be accomplished through various mediums, but fundamentally it is information provided to students in the initial steps of their college experience, contributing towards the development of an educational plan. How this mission is accomplished seems secondary to students' confidence in their undertakings.

The colleges seem to have executed their projects without great difficulty and, in some cases, been able to do preliminary matching of survey data with other student information such as grades and persistence. The "captive" surveys, either in classrooms or as students lined up for services, worked well. The mail survey efforts, however, were not particularly successful, partially because appropriate research protocols were not used. Long-term follow-up of students, called for in the Chancellor's accountability model and mandated by federal Student Right to Know and Vocational Education legislation, will probably require mail survey efforts by all institutions. Mail survey projects are more expensive and time consuming than the typical effort reported here, and institutions need to develop plans and strategies in order to accomplish the different research activities required in the future.

Appendix A

Summary of Telephone Survey on Matriculation Research

Due to the limited number of studies received for use in this document, the Local Research Options Project committee members volunteered to conduct a telephone survey inquiring into the research efforts of the California community colleges on matriculation evaluation. The survey was undertaken to ascertain the extent of research underway, the focus of the evaluation efforts and some initial findings. Two additional people, Brad Phillips and Eve Kelemen-Lohnas, joined the Local Research Options Project committee to assist with this effort and to participate in future activities.

The Matriculation unit of the Chancellor's Office sent out a memo informing colleges that the survey was being conducted and included a list of research questions to help schools prepare for the phone calls. The calls were made in December 1991 and focused on matriculation research conducted since fall 1989. Although the calls were made to the colleges' Matriculation Coordinators, most of the data was gathered from persons responsible for research. A copy of the research questions and survey form are included at the end of this appendix.

Results were collected from 90 of the 107 campuses, or 84%of the colleges. There is much more research underway than initially anticipated. Many schools have completed 2-3 studies, with more in progress. The majority of the effort has focused on conducting student satisfaction surveys and assessment validation. The next highest areas of research in are monitoring for a disproportionate impact and evaluating student success.

In the course of conducting the survey, a number of colleges expressed their frustrations in pursuing research. These include difficulty in setting up systems with which to identify their "served" matriculants, gaining access to the data critical for research and compiling the information of interest. Designating a person on the college campuses to conduct the research activities, also has been challenging evaluation efforts.

Colleges have made a good faith effort in pursuing the evaluation of their matriculation activities and have completed a significant round of studies, with more in progress. The following summarizes some of the colleges' initial findings by matriculation research theme. There is some unavoidable overlap between the themes. The nature of the surveying technique, telephone communication, does not allow for an in-depth exploration of the methodologies employed in the research reported here, hence leading to scant albeit somewhat illustrative data being presented in this summary. Therefore, tentativeness should be employed when reviewing the findings. Also included is a table depicting the number of studies conducted by research theme and the status of the projects.

Student Success

There were 39 colleges who reported that research has been conducted on the impact of matriculation upon student success. Some of the data were from district research offices which represent more than one college. Of the 39 colleges, 24 indicated that the research projects had been completed. This suggests that a number of colleges have a methodology in place but are awaiting outcomes. The research sample sizes varied widely. Those colleges with complete computer capability based their results on entire populations of students while others relied upon samples, some relatively small (e.g., 200-300 students), and others, quite large (e.g., 1,200 students).

The majority of colleges doing research on student success covered the basic components of admission, orientation, assessment, and counseling. Thirteen colleges also included the follow-up component. Nearly all colleges conducted descriptive comparison research, that is, comparing the performance of one group of students who received more matriculation services to another group who received less or no

services, or comparing students from an era that was pre-matriculation against a post-period. These studies were not truly experimental because students were allowed some degree of self-selection in regards to whether or not they participated in matriculation activities.

Of the 24 colleges reporting completed student success studies, 17 (or 71%) interpret their findings in a positive manner. The highest positive finding is with student persistence and retention. Students who received a full complement of matriculation services tended to stay in college longer than their counterparts who received little or no such services. Measures of success, which utilize performance in class such as GPA or number of units completed with grades of "C" or better, are sometimes higher for fully-served students but always are higher if such basic services were complemented by the addition of a counseling/guidance course. Hence, a robust matriculation treatment would seem to produce favorable outcomes whether it be student grade success, within-term retention, or persistence.

Comparisons of Alternate Matriculation Treatments

This research theme addresses the evaluation of activities in which alternate approaches to matriculation are attempted. Alternate approaches may involve any one of the matriculation components and are primarily concerned with students success and persistence. There were 11 studies reported, 9 completed and 2 in progress.

One study included over 100 students enrolled in a "Master Student" class. There was not strong evidence that this class improved student persistence or grades when compared with other matriculants.

Two counseling and advising studies were reported. One study of 71 students found that counselor judgment improves placement over a mechanized system. Another study found that students overwhelmingly appreciate advising by faculty.

A descriptive study involving both the Orientation and Counseling components, found that late registrants completed less units; however, their success rates and persistence were the same as regular matriculants.

Three of five follow-up studies examined ESL and special courses for Hispanics. One of these studies focused on support groups for ESL students. Using an experimental comparison with 120 students, it was found that the experimental sections had 0% and 5% withdrawal rates compared to 9% and 17% withdrawal rates, respectively, for the control groups. In-class support groups appeared to increase motivation to stay enrolled but did not necessarily increase learning related to measures of success. Two of three studies focused on the outcomes for Hispanics enrolled in special programs. It was found that these programs contributed towards greater success and retention for the students.

One experimental comparison study of 39 students found that high risk students who were referred by faculty and were randomly selected to receive treatment, had a 40% success rate compared to selected students receiving no treatment with a 5% success rate.

Finally, a unique follow-up study compared three different methodologies for teaching a basic arithmetic course. Of the 500 students participating in one of the three teaching methods, it was found that an unstructured variable unit lab had the lowest success rate at 48% compared to the classroom methodology at 53% and the structured math lab at 59%.

Fairness and Disproportionate Impact

The purpose of this type of research is to organize data to monitor for a possible disproportionate impact on special populations (i.e., age, gender, ethnic and disabled groups) as they proceed from placement testing through enrollment in nondegree basic skills courses to college-level courses.

Forty-nine colleges reported conducting research related to disproportionate impact. Twenty-six had already completed some research in this area. Thirty-seven were aimed at the assessment component.

Eleven colleges submitted completed research reports used in the Design 4 monograph. Most colleges initially focused on the progress of ethnic groups from placement in nondegree basic skills courses through enrollment in degree courses. Many looked at gender and age related to assessment and placement in nondegree basic skills courses. Two colleges reported data related to disabilities.

Very little impact was reported related to age and placement in nondegree basic skills courses. Occasionally, the students just out of high school would be more highly represented in math courses beyond arithmetic than the older students. In these cases, the differences between the remaining age groups were very small.

Only two colleges reported data related to disabilities. The placement differences were negligible for both colleges.

The majority of colleges found differences in the proportions of various ethnic groups between testing and placement in nondegree basic skills courses.

Although few colleges found gender differences in placement in nondegree reading or writing classes, several found that females were less apt to be placed into elementary algebra and higher math courses than males.

Very little difference was found related to ethnicity and enrollment in nondegree basic skills courses. Only 3 of the 14 (21%) colleges reported a possible disproportionate impact in this area.

None of the 12 colleges reported an impact as students moved from nondegree courses into degree coursework.

It appears that colleges are finding differences in the entering skills of various ethnic groups. Females were represented in lower numbers in elementary algebra and higher-level math courses. Little impact was found in enrollment in nondegree basic skills courses or persistence to degree courses.

In general, the data available is encouraging. More data is needed, however, to provide a broader picture related to possible disproportionate impact. Age, disability, and gender data, in particular, are needed beyond initial placement in nondegree basic skills courses.

Effectiveness of Remedial Coursework

The survey results indicate that twenty colleges have pursued research evaluating the effectiveness of remedial placement and coursework. Sixteen of these have been completed while the other four are still in progress. The components covered are assessment, counseling and follow-up.

Ten of the research studies focused on comparing outcomes of students who chose to follow colleges' advice to enroll in remedial coursework with students who did not enroll in the remedial coursework. The primary outcome measures were student success in degree-applicable courses and persistence to subsequent terms.

For the most part, students who were successful in their remedial coursework completed more degree-applicable courses successfully, with grades of "C" or better, and persisted at a greater rate than students who did not follow colleges' advice. Two colleges noted that their students were not receiving advice regarding the recommendation to enroll in remedial courses. Two additional colleges have this type of study in progress with no outcomes to report at this time. The numbers of students who have been included in the research studies range from 200-8,000.

Eight colleges focused on the effectiveness of remedial coursework as it relates to students' progress through the sequence of basic skills courses. There were mixed results regarding students' enrollment in the next level of a basic skills sequence, though matriculants tended to persist at higher rates. Many times

success in the initial course was good but success in the subsequent level dropped off. Three colleges were modifying their curriculum to provide for a smoother sequencing of courses. All of the schools had completed their studies but three had instituted this type of tracking on an ongoing basis.

The last two studies are in progress and it was not clear what the designs entailed beyond the tracking of remedial students.

The evidence seems to indicate that students who pursue remedial coursework fare better in college both in terms of their success in degree-applicable courses and persistence.

Research on Title 5 Basic Skills Prerequisites

Nineteen colleges reported conducting research on Title 5 basic skills prerequisites for classes. Their efforts focused on determining the relationship between basic skills assessment scores, or course completion in English and mathematics, with success in other areas of college-level instruction.

Sixteen of the nineteen institutions viewed the evaluation of students' English and mathematics skills as a measure of the effectiveness of their assessment component, about one-third also saw it as related to counseling and advisement. Around two-thirds of the colleges had analyzed their data, most indicated that a descriptive comparison of student performance was or would be utilized. One-third of the colleges also reported or plan to conduct a correlational analysis of their data. Most studies involved between 300 and 1,000 students; there was one smaller study and five with over 1,000 cases.

Most colleges utilized the design format provided by the Local Research Options Project to review a prerequisite of particular interest to them. Only a few actually used the English prerequisite-level and U.S. History course proposed by the model. The reports cover a wide range: one institution recommended dropping the English prerequisite from their Administration of Justice program; another college found significant variation in the correlation between success in English courses and other entry-level college courses; and many were just beginning preliminary studies.

A quantitative study of 5,974 students found that students meeting the prerequisites for courses had a much higher success rate than those students not meeting the prerequisites.

One study of 2,827 students focused on the impact of skills prerequisites on student enrollment, retention, and success. It was found that requiring reading proficiency as a condition for enrollment resulted in higher retention and student success without having an adverse effect on enrollment.

Findings were viewed as positive by the colleges. A number of institutions found that student performance at different levels of their basic skills curriculum related to success in college-level work but variations did not afford a clear prerequisite recommendation. Several colleges noted that faculty groups or departments were reviewing the findings and one indicated that faculty were making curricular changes as a result of the research.

Student Access

The purpose of this research is to determine the impact of required matriculation activities upon student access and enrollment. There were a total of 10 survey reports on student access; five were based upon completed research while the other five were in progress. The studies covered the components of admission, orientation, assessment, and counseling. The typical sample size of the studies was approximately 265 students. The colleges' interpretation of their findings were positive. Colleges indicated that requiring matriculation activities appeared to have no adverse impact upon access. Reasons why admitted students failed to register appear to be unrelated to matriculation services.

Changes in Student Goals

One objective of the matriculation process is to help students clarify their educational goals and to develop plans to reach those goals A more efficient use of colleges' resources was one desired outcome for this process. Greater retention of students also was hoped to follow when students have clear visions of their goals.

Nineteen colleges reported that they were engaged in student goal research. Six had completed their studies. In general, the studies involved large numbers of students typically ranging from 1,000 to 7,000 students. The admission and orientation areas were cited as the components being studied. The results were reported as being either positive or descriptive.

The most consistent finding was the change in stated goals for undecided students from completing the application to after assessment, orientation, and counseling/advisement. Undecided students changed their goals most frequently. One college reported that 68% of their students had "undecided" as an initial goal and 6% after the conclusion of matriculation activities. Another college cited 35% of students as undecided at admission; 10% after matriculation.

Several colleges reported a high rate of change in any of the stated goals from application to after matriculation activities. Eighty-three percent of the students at one college changed their goals from admission to after matriculation.

A high rate of change to degree and transfer goals was reported by several colleges. Sixty-four percent of undecided students changed to an AA/AS goal, 17% to AA without transfer and 9% to transfer without degree. At another college, 29% chose a transfer goal upon admission, 74% after matriculation activities.

Several difficulties have prevented colleges from monitoring student goal changes related to matriculation. It is difficult to collect pre-and post goal information on students before and after matriculation activities.

The results of the studies conducted to date are positive and reveal that the intent of AB3 to help students clarify their goals as part of matriculation is being achieved. It also shows that the emphasis on transfer education is being served. Further studies across more colleges are needed to substantiate these initial findings.

Student Satisfaction Surveys

The results of the telephone survey provided student satisfaction information from 64 community colleges; some studies were reports from multi-college districts. These efforts were focused on ascertaining students' perceptions and reactions to college services related to admissions, orientation, assessment, and the counseling/ advisement components of matriculation. A few smaller studies focused on orientation, although two focused on assessment only. A large majority of the surveys were administered in the classroom. There were a few mail surveys and a small number given to students as they waited to complete a task. Two institutions collected information from students when they submitted petitions for graduation. Most projects drew from materials provided in Design 9, but some institutions had student satisfaction surveys of their own while several used instruments from outside vendors.

The smallest studies, around 100 students each, were those focused on an orientation class evaluation or survey of the assessment process. The largest survey reached 9,000 students in a particular district, while the typical project involved between 1,000 and 3,000 students. Most of the student satisfaction studies had been completed, but some were in the process of being collected and others were planned for Spring '92 . A couple of colleges had collected student survey responses but were unable to compile and analyze their data due to fiscal and /or time constraints.

A high level of student awareness and satisfaction with matriculation services was reported across the colleges. Institutions were able to utilize students' feedback to improve their services. A minimum of

detail was reported during the telephone survey but when specifics were discussed, the value of matriculation activities seemed clear. Campuses reported such things as: 1) fully-matriculated students were more likely to return for their second semester than partially- or non-matriculated students; 2) students participating in matriculation activities were more likely to have seen counselors and have educational plans; and 3) fully-matriculated students reported higher levels of satisfaction with services than non-matriculated students. Reports from colleges that conducted smaller, more specific surveys, reported that students found orientation activities helpful and were satisfied with the assessment process and their placement recommendations.

All reports indicated that the colleges viewed the results of the student surveys as positive and potentially constructive for their institutions.

Assessment Validation

There are approximately 100,000 community college students in the state of California who have participated in research on the validity and reliability of tests and placement criteria. The majority of the studies involved only the assessment component and were analyzed using correlational methods. Studies in progress include approximately 50,000 students covering the areas mentioned above as well as content validity and the disproportionate impact of testing and placement criteria. The following is a summary of the results reported by area of specialization. Respondents at many colleges could not be specific about the outcomes of the studies. Results that were negative often lead to positive steps being taken to improve practices. Generally, respondents felt that the studies assisted them in pinpointing where courses, course sequences and/or placement practices required modification.

Validation of Objective Tests for English

Of the 29 studies conducted, 27 involved computing the correlation coefficient between the objective test and the outcome in the course. The majority reported positive results. Correlations ranged from .05 to .63. The higher levels of English were more likely to show strong correlations with tests than the lower levels, though there were a number of colleges reporting no significant correlation between test score and grade. This latter finding may be due to the fact that placement schemes are already in use at many colleges. Though only suggested, students frequently do follow the advice given. This restricts the range of test scores contributing toward the correlation coefficients which diminishes the strength of the correlation.

Reliability and Validity of Writing Samples

The two studies conducted on interrater reliability reported good agreement between independent judges ($r = .93$ in one case). Similarly, there was a 90% agreement between writing prompts in one study. Another study of homegrown prompts found that their use discriminated against disabled students. The two validity studies produced mixed results. Writing samples were predictive of success in transfer level English courses in one case. In the other, they were abandoned due to their lack of predictability.

Validation of Mathematics Tests

There were 16 correlational studies reported to the surveyors. Three of these also included descriptive comparisons. The correlations were better for higher level math classes and ranged from .30 to .57. The tests, particularly the MDTP, were found to have good predictive power. Findings were mostly positive.

Validation of English Placement

The majority of the 13 studies reported the need for new placement criteria and further investigation of cut scores. The effectiveness of multiple measures will be evaluated in future research. The net gain over base rate was often low; since counseling students into recommended courses is already in practice, the range of students enrolled in targeted courses is restricted. This would cause the initial base rate to be high. Some colleges did report success rates of qualified students compared to those not qualified to be 20-60% higher.

Validation of Mathematics Placement
Of the 11 studies reported, 8 used correlational methods, 2 descriptive comparisons and one an experimental comparison. Many found small gains over the base rate. Most reported using a procedure to raise and lower the cutscore (mathematically) to find the one that would improve over the base rate. Some of the reports reflected that researchers may confuse test predictive validity studies with studies to determine the effectiveness of cut scores.

Test Reliability
One college performed a reliability study on the MDTP test. It was found to meet all state requirements. Reliability was computed by age, gender and ethnic categories, but in many cases were too small for evaluation. The only significant difference was between females ($r = .822$) and males ($r = .675$) on the calculus test.

Multiple Measures for Placement
Of the 5 colleges that completed these studies, 4 interpreted their findings as positive. For math success, high school grade point average was found to be a good predictor. Age gender, high school grade point average, and grade in last English class were significant in predicting success in English courses.

Miscellaneous Evaluation of Assessment

Nineteen colleges pursued the evaluation of their Assessment/Placement programs in a fashion beyond that of predictive validity research. This type of investigation complements predictive validity data in providing additional information on the effectiveness of assessment instruments and placement processes.

Ten colleges surveyed either both their students and faculty, or only students or faculty regarding their perceptions of the accuracy of the students' placement in both remedial and degree-applicable basic skills courses. Five of these were both the faculty and students' perceptions, two were students' only and one, faculty only. The sample sizes ranged from 150 students to 1,500. Two colleges have yet to compile their data or will be surveying the students and faculty in the Spring '92 term.

The results indicate positive perceptions by students on the accuracy of their placement in the basic skills classes, ranging from 82%-90% agreement with the placement. For the most part, faculty also felt students were placed appropriately in their courses; however, two of the colleges reported that their faculty felt the students should have been placed lower.

Another college generated information on the proportions of students placed in their various levels of basic skills courses, both remedial and degree-applicable. This type of data collection is valuable to compile on an ongoing basis as it is extremely helpful in scheduling the appropriate courses to meet entering students needs for basic skill instruction.

Four studies were conducted on faculty review of assessment instruments for the appropriateness of content and cultural bias. The findings were reported as positive or descriptive only.

These are some diverse types of qualitative research which can be utilized in the evaluation of assessment instrument and placement practices. Studies conducted in the future could elucidate new, creative and substantive ways in which colleges can measure the effectiveness of the assessment component.

Miscellaneous Evaluation of Matriculation

This section represents a mixed bag of studies examining everything from staff perception of matriculation activities to follow-up surveys asking students about their activities outside of the classroom.

Of the two orientation studies collected, one found that 84% of the 222 students surveyed had a clear understanding and working knowledge of orientation. The second study concluded that students were very satisfied with the orientation session and that there was little difference in student satisfaction ratings

between live instruction and interactive computerized orientation (N = 3,223). Furthermore, it is interesting to note that females rated the orientation session significantly higher than males.

Information on five follow-up studies was collected. Two of the studies examined the reasons that students state for dropping their classes. One study of over 370 students found that "time conflicts" are the most frequently stated reasons. Another study of 212 students found that there was nothing the college could have done to keep the students from dropping their classes. Students had left for personal reasons beyond the institution's control.

One follow-up study involved 1,500 students taking history and political science courses who utilized tutoring services, office hours and called their instructors. It was found that the students' performance early in the semester was a good predictor of how they did later in the term. Furthermore, the more contact instructors have with their students, the better the students perform in class.

Another follow-up study surveying 1,000 students found that student effort and time spent in college activities outside of class contributed to college success.

One unique study involving a descriptive comparison of over 70 college staff concluded that college administration officials and the Board of Trustees had a good understanding of matriculation. However, faculty are aware only of student services.

One study involving admission, orientation, assessment, counseling and follow-up (tutoring) surveyed their graduates in 1990 and 1991. Both years of graduates reported that "counselor helpfulness" was good/excellent and that orientation was also good/excellent.

Finally, a study involving 400 students participating in the admissions, orientation, and assessment components found that students are more focused in their questions following orientation than they used to be before matriculation was in place. This finding was substantiated by the counseling staff.

All of the findings in the follow-up studies were viewed as positive.

Research Themes by Status of Study

Research Theme	Number of Studies	Completed	In Progress	Uncertain
Student Success	39	24	15	N/A
Comparisons of Alternate Matriculation Treatments	11	9	2	N/A
Fairness and Disproportionate Impact	49	26	19	4
Effectiveness of Remedial Coursework	20	16	4	N/A
Research on Title 5 Basic Skills Prerequisites	19	14	5	N/A
Student Access	10	5	5	N/A
Changes in Student Goals	19	6	8	5
Student Satisfaction Surveys	64	44	19	1
Assessment Validation	128	82	46	N/A
Miscellaneous Evaluation of Assessment	19	17	2	N/A
Miscellaneous Evaluation of Matriculation	15	11	4	N/A
Total	393	254	129	10

SURVEY OF MATRICULATION RESEARCH ACTIVITIES

Caller: _____ **College:** _____

Contact: _____ **Phone #:** _____

(Information above this line will not be included in the report.)

Research Theme:

- ❑ Student Success
- ❑ Comparisons of Alternate Matriculation Treatments
- ❑ Fairness/Disproportionate Impact
- ❑ Remediation Effectiveness
- ❑ Title 5 Research
- ❑ Student Access
- ❑ Student Goals
- ❑ Student Satisfaction
- ❑ Assessment Validation
- ❑ Misc. Evaluation of Matriculation
- ❑ Misc. Evaluation of Assessment

Study Title: _____

Components Involved:

- ❑ Admissions
- ❑ Orientation
- ❑ Assessment
- ❑ Counseling & Advisement
- ❑ Follow-up
- ❑ Coordination & Training

Status of Study:

- ❑ Completed
- ❑ In progress

Method/Study Type:

- ❑ Descriptive comparison
- ❑ Experimental comparison
- ❑ Correlational
- ❑ Survey
- ❑ Interview
- ❑ Qualitative methods

Number of Students: _____

Key Findings: _____

_____

_____

_____

College Interpretation:

- ❑ Positive findings
- ❑ Negative findings
- ❑ Uncertain/ambiguous findings
- ❑ Descriptive only (Provide description)

LOCAL RESEARCH OPTIONS PROJECT

Survey of Matriculation Research Activities

Research Questions and Outcome Measures

HAVE YOU CONDUCTED ANY RESEARCH RELATED TO MATRICULATION SINCE FALL '89?

SUCCESS

1. Have you conducted any research comparing differences between students who received matriculation services and students who did not receive services? **Outcome measures:** *persistence, retention, performance, cumulative units completed successfully, success rates.*

SUCCESS

2. Have you conducted any research comparing the performance of students before and after implementing matriculation activities? **Outcome measures:** *withdrawals, persistence, successful units completed.*

ALTERNATE APPROACHES TO MATRICULATION

3. Have you conducted any research comparing alternate approaches to matriculation services? (e.g., different ways of providing orientation, counseling, etc.) **Outcome measures:** *success rates, persistence.*

DISPROPORTIONATE IMPACT

4. Have you conducted any research monitoring assessment and subsequent placement for a disproportionate impact on the identified groups (i.e., ethnic, age, gender, disability)? **Outcome measure:** *proportions of students assessed and placed into different levels of basic skills.*

   Have you conducted research examining the special populations enrollment in remedial (non-degree applicable) basic skills classes and subsequent coursework? (e.g., movement into associate degree courses) **Outcome measures:** *differences in proportion of students enrolling and succeeding in basic skills courses; differences in proportions of students enrolling and succeeding in Associate-degree level courses.*

REMEDIATION EFFECTIVENESS

5. Have you conducted any research evaluating the effectiveness of remedial coursework on subsequent college coursework? **Outcome measures:** *for advice followers persistence, success rates in subsequent terms.*

TITLE 5 BASIC SKILLS PREREQUISITE RESEARCH

6. Have you conducted any research determining what basic skill levels (reading, writing and/or math) are necessary for successful completion of college-level coursework (other than basic skills classes)? (i.e., generating data for the establishment of Title 5 placement level prerequisites) **Outcome measure:** *success rates by basic skill levels.*

ACCESS

7. Have you conducted any research analyzing changes in student registration (enrollment) rates since the implementation of matriculation activities? **Outcome measure:** *differences in the percent of students applying for college and registering (or not) for classes; by special population groups.*

STUDENT GOALS

8. Have you conducted any research evaluating if students declare or change their educational goals after participating in matriculation activities? **Outcome measure:** *changes in student declared educational goals between applying for college and later.*

STUDENT SATISFACTION

9. Have you administered any satisfaction surveys regarding your matriculation efforts? (e.g., in-class surveys) **Outcome measures:** *student responses to items; responses by subgroups.*

ASSESSMENT VALIDATION

10. Have you conducted any predictive validity research on your assessment instruments? **Outcome measures:** *correlation coefficients (Pearson r, Point Biserial r, Phi); was a correction for restriction of range utilized, success rates?*

11. Have you conducted any research validating your cut scores used in forming placement recommendations? **Outcome measures:** *success rates of eligible and non eligible students, net gain in correct placements, percent of students placed correctly.*

12. See #4.

13. Have you conducted any research examining differences for your assessment instruments in predictive validity for special populations? **Outcome measure:** *correlation coefficients, means, standard deviations and regression equations for the special population groups.*

MISCELLANEOUS ASSESSMENT

14. Have you evaluated your assessment instruments for content validity or cultural bias? **Outcome measure:** *ratings by faculty.*

15. Have you conducted any student and/or faculty evaluation of placement results (e.g., in-class surveys)? **Outcome measure:** *percent of students perceived to be placed appropriately, over or under.*

ERIC CLEARINGHOUSE FOR
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